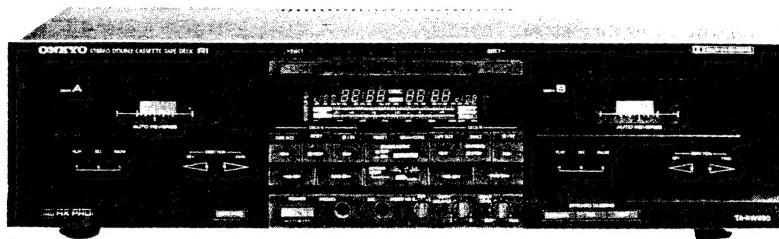


# ONKYO SERVICE MANUAL

## STEREO CASSETTE TAPE DECK

MODEL TA-RW490



**Black model**

UDN, UDC, UD	120V AC, 60Hz
UG	220V AC, 50Hz
UW	120 or 220V AC, 50/60Hz
UQA, UQB	240V AC, 50Hz

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\triangle$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

### SPECIFICATIONS

Track System:	4-tracks, 2-channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.) 9.6 cm/sec. (3-3/4 i.p.s.) (high speed dubbing)
Wow and Flutter:	0.06% (WRMS)
Frequency Response:	20-15,000Hz (Normal) (30-14,000Hz $\pm$ 3dB) 20-26,000Hz (High) (30-15,000Hz $\pm$ 3dB) 20-17,000Hz (Metal) (30-16,000Hz $\pm$ 3dB)
S/N Ratio:	Dolby NR off: 58dB (metal position tape) A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B NR. A noise reduction of 20dB at 5kHz is possible with Dolby C NR.
Input Jacks:	Microphone jack: 1 Input sensitivity: 1mV/600 ohms Input impedance: 5.6 kohms
Outputs:	Line IN: 2 Input sensitivity: 60mV Input impedance: 50 kohms
Motors:	Headphone jack: 1 Optimum load impedance: 8 to 200 ohms
Heads:	Line OUT: 2 Standard output level: 500mV (0dB) Optimum load impedance: over 50 kohms
	DC servo motor x 2; DC motor x 2 REC/PB: special hard permalloy x 2; Erase head: ferrite x 2



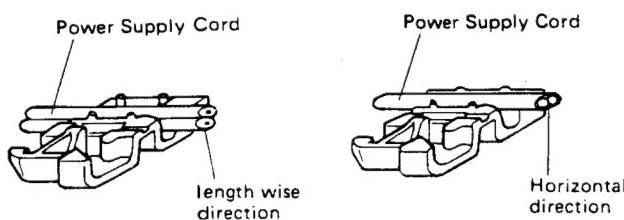
Power Supply:	AC 120V, 60Hz
Power Consumption:	37 watts
Dimensions:	435(W) x 115(H) x 334 (D) mm (17-1/8" x 4-1/2" x 13-1/8")
Weight:	6.2 kg. (13.6 lbs.)

Specifications and external appearance are subject to change without notice because of product improvements.

## SERVICE PROCEDURES

### 1. Replacement of power supply cord

There are two power supply cord outlets on the strainrelief. Insert them in prescribed direction to ensure safety. AS-UC-3 (UD<120V> model) should be inserted lengthwise and other types of cords should be inserted horizontally.



### 2. Instruction resistance measurement

Connect the insulating-resistance tester between the plug of power supply cord and chassis.  
Specifications: 500V more than 10MΩ

## MECHANISM OPERATION

### 1. Overview of the Cassette Drive Mechanism

The cassette drive mechanism consists of two motors and one solenoid. It is based on the same principle as our previous three-motor mechanisms (which employed separate capstan, reel and assist motors) except that one motor is used for both the reel and assist functions. The solenoid is provided to switch between the two functions. As the mechanism is basically identical to our previous three-motor configuration except for the reel/assist switching function, the discussion below will focus on the switching function's main features.

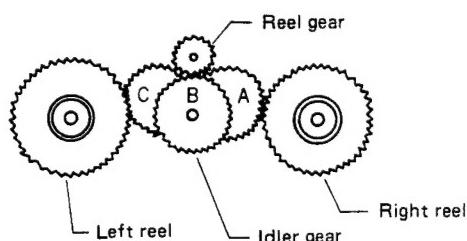


Figure 1: Frontal View of the Assist/Reel Drive Train

In the previous (three-motor) mechanism, the idler gear had two positions: A for fast forward and C for rewind. In the new configuration a third position (B) is added for assist operation.

In the B position, the idler gear is linked to a cam which raises and lowers the heads and rotates them during auto-reverse play. To keep the gear firmly in position, a notched lever presses up against the gear shaft from below. The gear shaft rests in the notch in the lever, maintaining the idler gear in the B position. This arrangement makes it possible to use a single motor for both the reel and assist functions.

Attraction from the solenoid is used to switch from the assist position (position B in figure 1 above) to either the rewind or fast forward position for reel operation. Attractive force from the solenoid is applied to the notched lever, pulling it downward. This disengages the gear shaft from the notch and frees the gear. Then, by applying voltage to the motor, the idler gear can be moved to either the A or C position for reel operation. The notched lever also acts a brake for the reels when solenoidal attraction is applied.

In order to switch back from reel to assist operation, the polarity of the voltage being applied to the motor is reversed. This causes the gear to jerk in the direction of the opposite reel. When it comes to point B, however, the gear shaft catches in the notch in the lever, holding the gear in position for assist operation. This design ensures that the idler gear always switches initially to the assist position before switching to another operation. This also guarantees that the mechanism will be in the correct position after all operations are completed.

The assist/reel motor uses three different voltages to perform the operations described above. The approximate voltages are as follows: 8V for assist operations; 6V for high-speed fast forward and reverse; and 3.5V for recording and playback. They are controlled by the TRQ1 and TRQ2 signals from the microprocessor. In assist operation, the idler gear turns clockwise (viewed from the front) during forward play and counterclockwise during reverse play.

### 2. Mechanism Drive System

The waveforms which drive the mechanism look rather complicated on an oscilloscope. If we break them down into the basic patterns which indicate separate operations, however, and display the combined result in tabular form, table 1 is the result. When the operations listed under "Mechanism Operations" are performed in the order specified (i.e. left to right), the operation "modules" listed under "Drive Sequence" are activated in the order shown (left to right). Figure 2 through 8 below illustrate the waveforms for the various modules.

Note: The polarity of the waveforms differs depending on the direction of tape travel and the type of operation. All durations are given in milliseconds [ms].

Mechanism Operations		Drive Sequence		
PLAY	→ STOP	A	→ E	→ G
SEARCH	→ STOP	C	→ B	→ A
FF/REW	→ STOP	C	→ G	
STOP	→ PLAY	A	→ D <sub>2</sub>	
PLAY	→ SEARCH	A	→ D <sub>1</sub>	
STOP	→ FF/REW	D <sub>1</sub>		

Table 1: Drive Sequences for Representative Operations

#### ■ Drive waveform for assist operation

- A: While searching for target position  
 B: The motor reverses to absorb inertia for 30 ms when the heads are being raised and 70 when the heads are being lowered.

**Note:** The 5 ms gap between A and B is needed in order to move the tape to the center of the target area. The 50 ms period following B is for resetting the mechanism position. Assist operation is performed again if the position is not correct. In this case (only), B is 10 ms in duration. The (■) mark indicates the mechanism position double-check point.

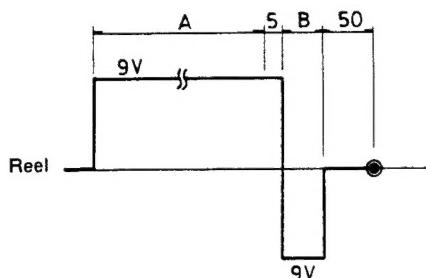


Figure 2: Module A

#### ■ Drive waveform 1 for changing position of idler gear

If the capstan motor is turning when the reel drive signal is received, it is shut off.

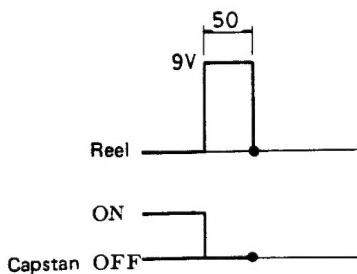


Figure 3: Module B

#### ■ Drive waveform for brake

Attraction from the solenoid engages the brake. The final 10 ms gap is the pause before the next operation starts.

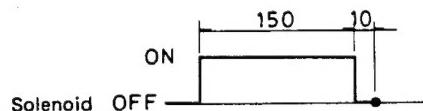


Figure 4: Module C

#### ■ Reel drive waveform

(Used during fast forward, reverse and music search)

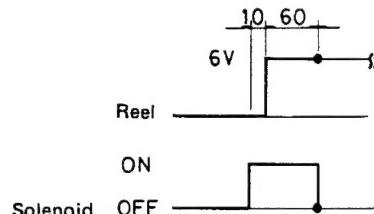


Figure 5: Module D1

#### ■ Reel drive waveform

(Used during record and playback)

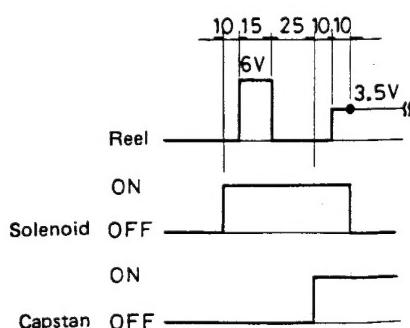


Figure 6: Module D2

■ **Waveform for taking up tape slack**

The reel drive voltage normally consists of 15 pulses (3.5V: on 5 ms, off 2 ms). The number of pulses is increased to 25 during double-speed operation.

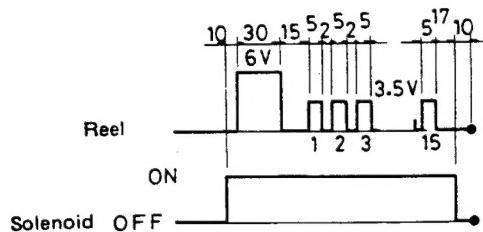


Figure 7: Module E

■ **Drive waveform 2 for changing position of idler gear**

The movement produced is the same as in module B. However, after the first 50 ms peak, the position of the mechanism is checked. If it is not in the stop position, module A is executed. The duration of assist reverse rotation is 10 ms in this case. The (■) mark indicates the mechanism position double-check point.

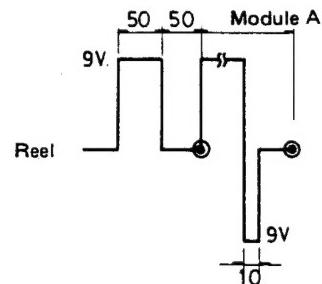


Figure 8: Module G

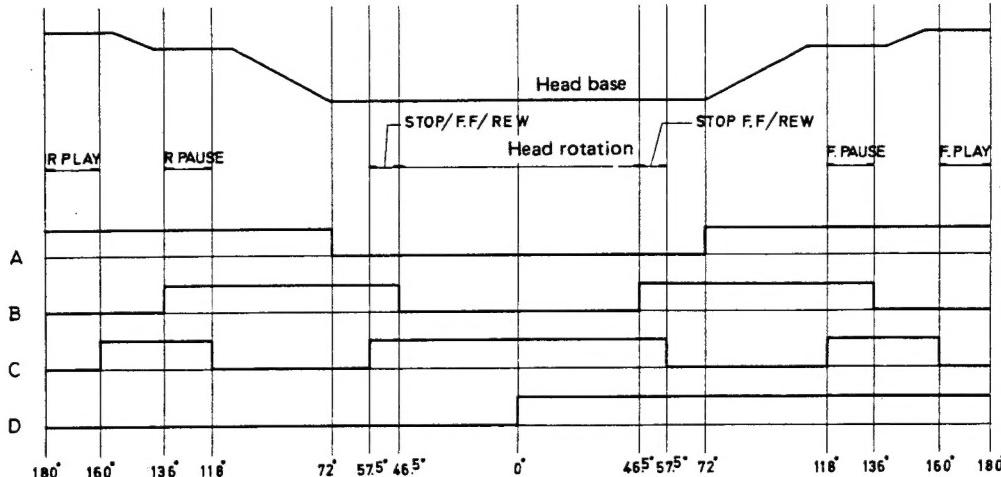
**3. Initialization of the Mechanism**

When power is initially turned on, there is no guarantee that the idler gear is in the assist position. Therefore, signals are issued to move the idler gear first to the left and then to the right, and the gear is secured in position B as shown in figure 1 above. Then modules A, E and G are

executed in succession to put the mechanism in the stop position.

**Note:** In this particular case, the number of pulses in module E is 25 (the same as during double-speed operation).

**4. Mechanism Positioning Data**

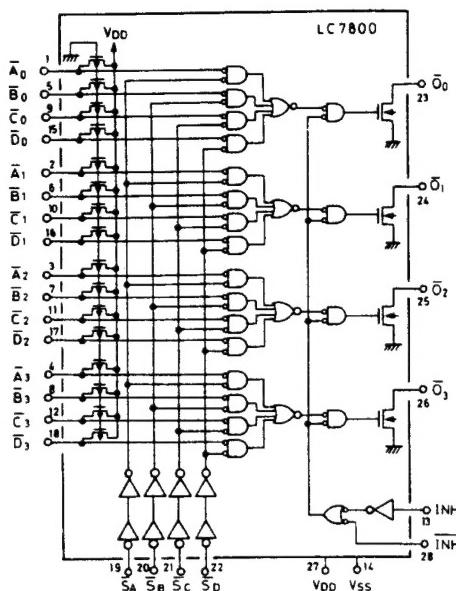


Note: The dotted lines in the positioning data indicate either "0V" or "switch on".

Figure 9: Mechanism Positions and Positioning Data

## 5. Microprocessor and Input Expander

Two input expanders (LC7800) are used to expand the number of inputs to the microprocessor. These ICs each have four 4-bit input ports ( $A_0-3$ ,  $B_0-3$ ,  $C_0-3$ ,  $D_0-3$ ). Four designation input signals are used to specify input ports:  $\overline{S_A}$ ,  $\overline{S_B}$ ,  $\overline{S_C}$ ,  $\overline{S_D}$ . If one of the input signals is set to 0 logic, the input port designated by that signal is selected and that input signal is transferred to the output port ( $O_0 - O_3$ ). INH and  $\overline{INH}$  signals are used to differentiate expanders 1 and 2.

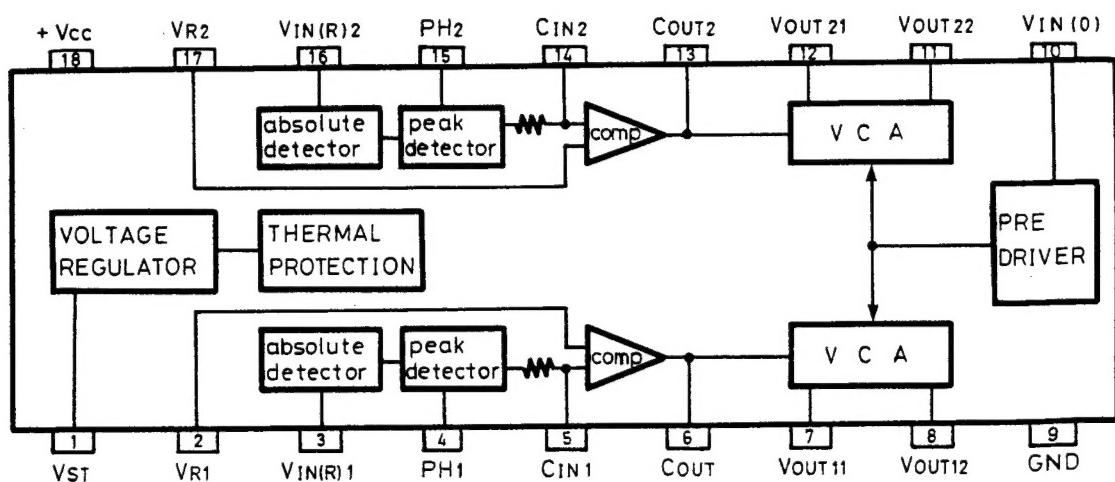


LC7800 equivalent circuit

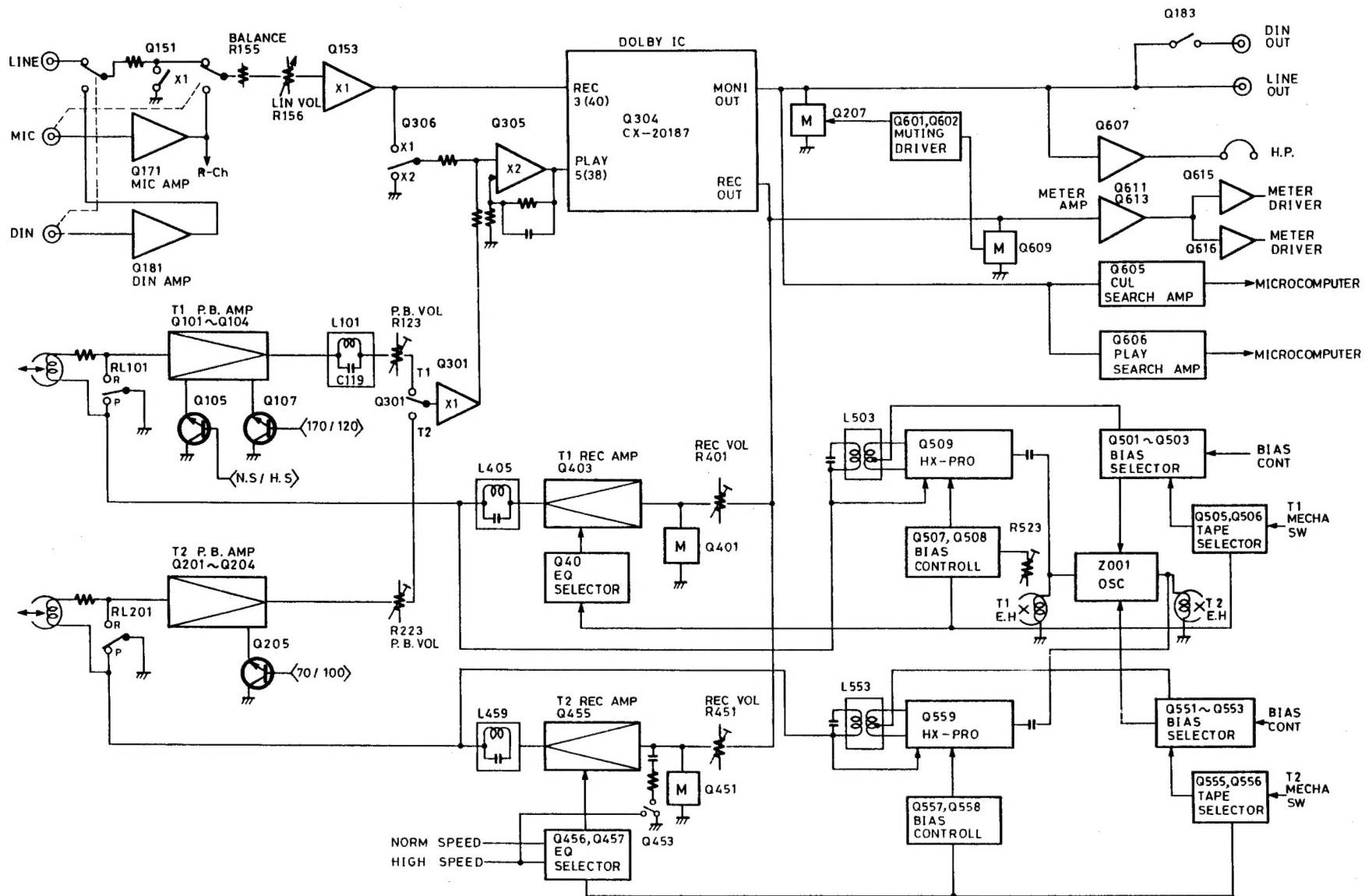
## $\mu$ PC1297CA (DOLBY HX PRO SYSTEM)

When the HX PRO is operation, by means of the recording signal coming from the recording head, a modulating oscillator voltage is applied to the absolute value detection circuit, and by means of the recording signal level peak detection value, the bias current is instantaneously controlled. At such time, by means of the CR integrated circuit, the frequency characteristic is maintained.

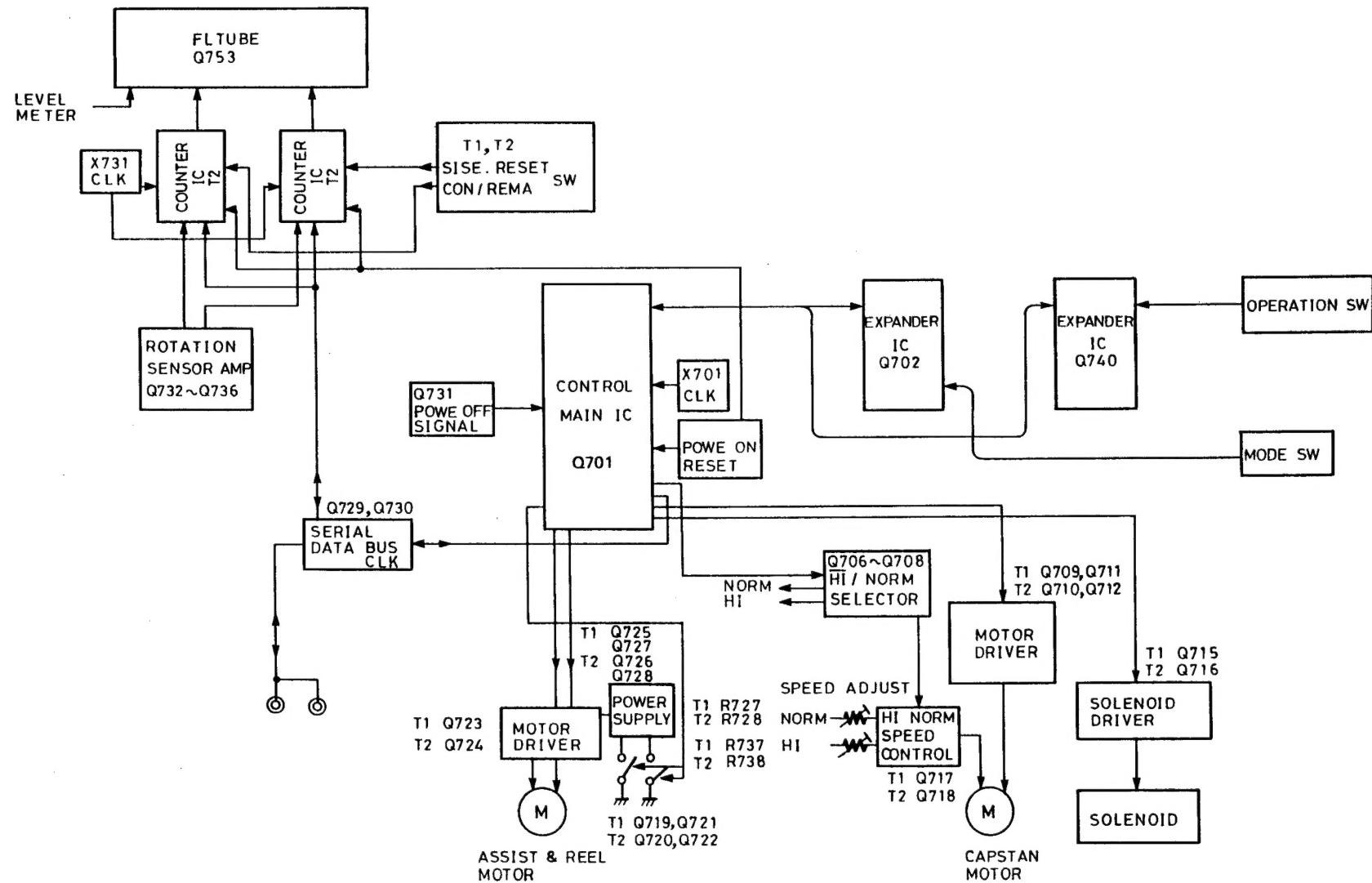
## $\mu$ PC1297CA



# BLOCK DIAGRAM (AUDIO SECTION)

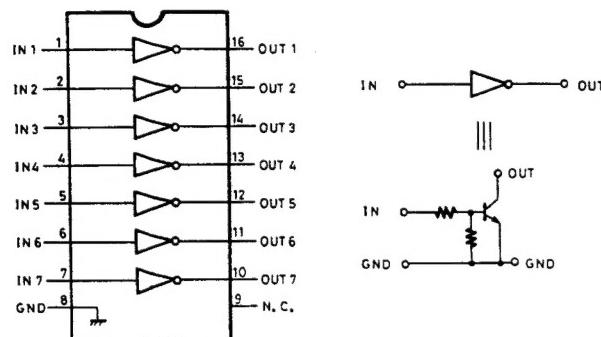


# BLOCK DIAGRAM (CONTROL SECTION)

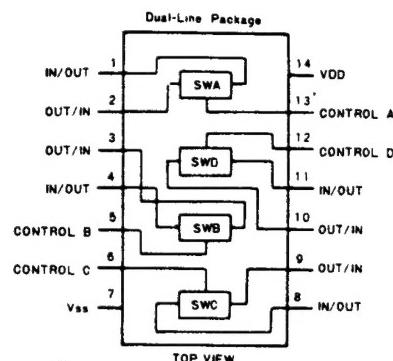


## IC BLOCK DIAGRAM

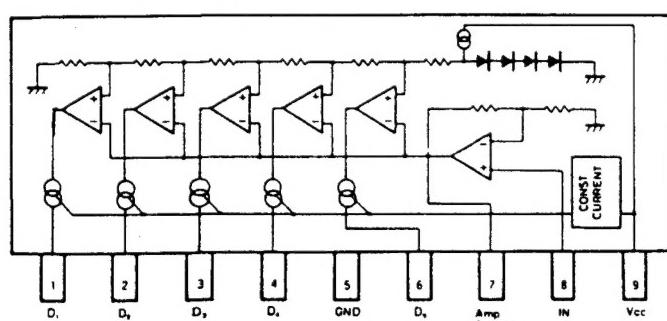
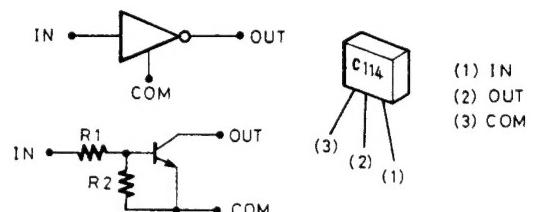
BA6251 (REC AMP. EQ. SW)



4066B or BU4066BP

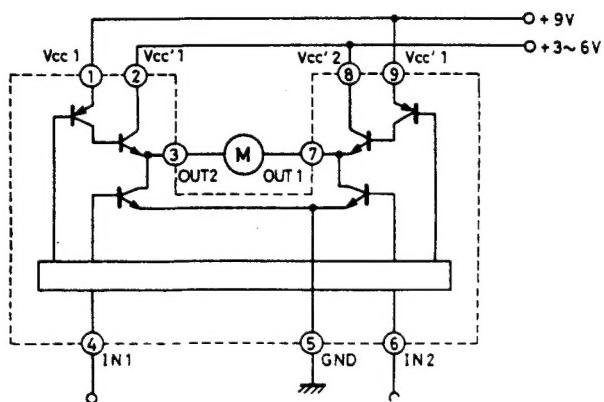


BA6137 (METER AMP)

DTC144ES (Digital transistor)  
DTC114YS (Digital transistor)

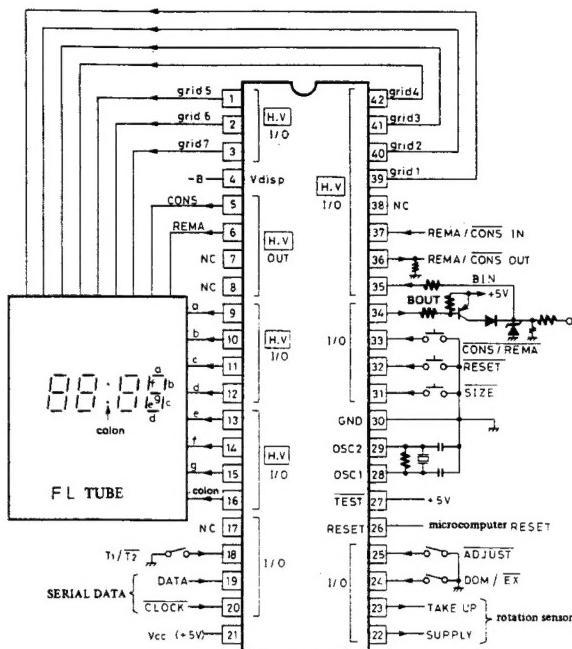
	R 1	R 2
DTC 114YS	10 KΩ	47 KΩ
DTC 144ES	47 KΩ	47 KΩ

M54544AL (MOTOR DRIVE)



INPUT		OUTPUT		Remark
# 4	# 6	# 3	# 7	
L	L	OFF	OFF	—
H	L	H	L	FWD
L	H	L	H	REV
H	H	L	L	Brake

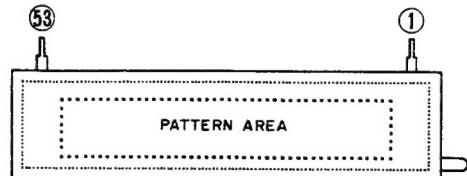
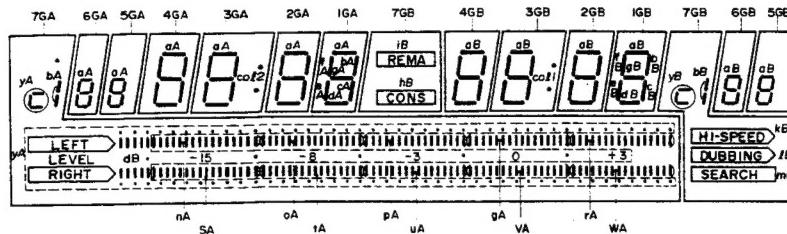
## HD614128S-A41 (COUNTER)



## Terminal Name and Function

Pin No.	Name	Function
1 ~ 3	Grid 5 ~ 7	FL tube grid (DIGIT) drive use output
4	V <sub>disp</sub>	Input (FL tube use) for minus bias voltage to pin Nos. 1 ~ 3, 5, 6, 9 ~ 16, 39 ~ 42
5	CONS	FL tube [CONS] display use output (time lapse)
6	REMA	FL tube [REMA] display use output (time remaining)
9 ~ 15	a ~ g	FL tube segment drive use output
16	Colon	FL tube ":" drive use output
18	T <sub>1</sub> /T <sub>2</sub>	Microcomputer T <sub>1</sub> /T <sub>2</sub> function selection input (With T <sub>2</sub> , system I/O receiving)
19	DATA	Reck mechanism status input (8 bit serial data) from mechanism control micro-computer
20	CLOCK	Clock input for reading above DATA (DATA taken on pulse wave dropping)
21	V <sub>cc</sub>	Microcomputer power source (+5V)
22	SUPPLY	Cassette mechanism tape feed side turning pulse input
23	TAKE UP	Cassette mechanism tape windup side turning PULSE INPUT
24	DOM/EX	Domestic/export setting use selector input (Tape size type selector use) Domestic: With power ON C46 → C54 → C60 → C80 → C90 → C120
25	ADJUST	Remaining time calculation buffer compensating value input (normally open, compensating ground)
26	RESET	Microcomputer system reset
27	TEST	Microcomputer internal test use port, normally connected to V <sub>cc</sub>
28, 29	OSC1, OSC2	Microcomputer clock oscillator terminal
30	GND	Microcomputer power source (GND)
31	SIZE	Tape size selector input
32	RESET	Lapsed time reset input (When [CONS] displays, digits are □ : □ □)
33	CONS/REMA	Lapsed time ← → remaining time selector input (toggle display)
34	BOUT	System bus output
35	BIN	System bus input
36	REMA/CONS OUT	Remaining time display/lapsed time display status output (when T <sub>2</sub> )
37	REMA/CONS IN	Remaining time display/lapsed time display status input (when T <sub>2</sub> )
39 ~ 42	Grid 1 ~ 4	FL tube grid (DIGIT) drive use output

## BG-485G (DISPLAY TUBE)

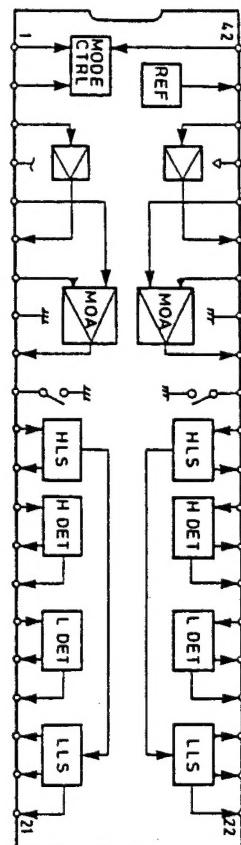


## PIN CONNECTION

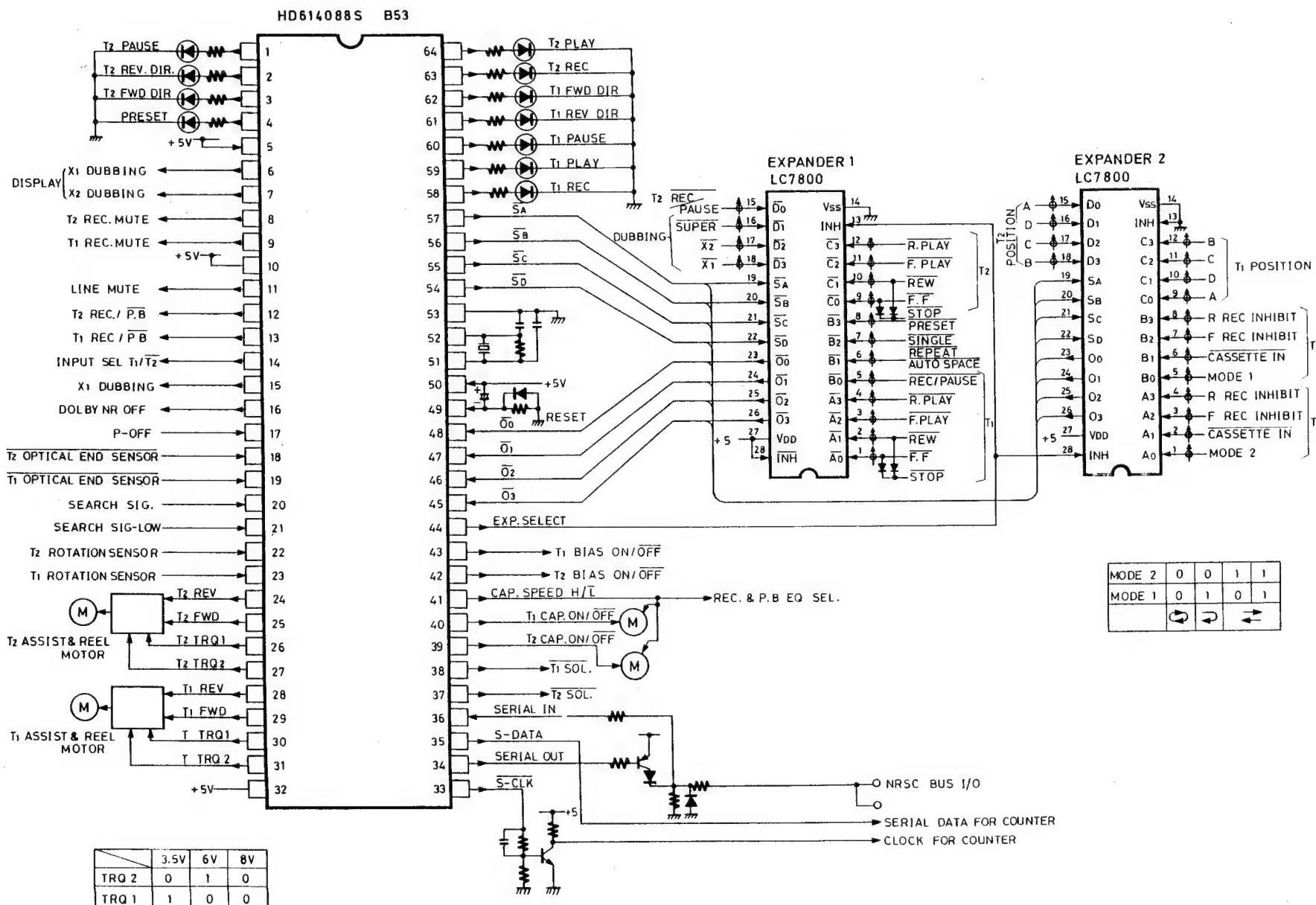
53	52	51	50	49	48	47	46	45	44	43	42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
F 2	F 2	N P	w A	v A	u A	t A	s A	r A	q A	p A	o A	n A	x A	g A	f A	e A	d A	c A	b A	N P	N P	7 G A y A	6 G A A	5 G A A	4 G A A	3 G A A	2 G B A	1 G B B	x B B	i B B	h B B	g B B	f B B	e B B	d B B	c B B	b B B	a B B	G B B	6 G B B	5 G B B	4 G B B	3 G B B	2 G B B	1 G B B	k B B	l B B	m B B	N P 1	F 1	F 1	

## CX20187 (DOLBY N.R.)

B/C	1	42	REC / PB
ON/OFF	2	41	IREF
LINE IN	3	40	LINE IN
Vcc	4	39	Vee
PB IN	5	38	PB IN
MPX OUT	6	37	MPX OUT
REC IN	7	36	REC IN
GND	8	35	GND
LINE OUT	9	34	LINE OUT
SSK	10	33	SSK
VF IN	11	32	VF IN
HPF H	12	31	HPF H
TCH2	13	30	TCH2
TCH1	14	29	TCH1
WT H	15	28	WT H
TCL2	16	27	TCL2
TCL1	17	26	TCL1
WT L	18	25	WT L
HPF L	19	24	HPF L
ANT S	20	23	ANT S
REC OUT	21	22	REC OUT



# HD614088S-B53 (MICROCOMPUTER)

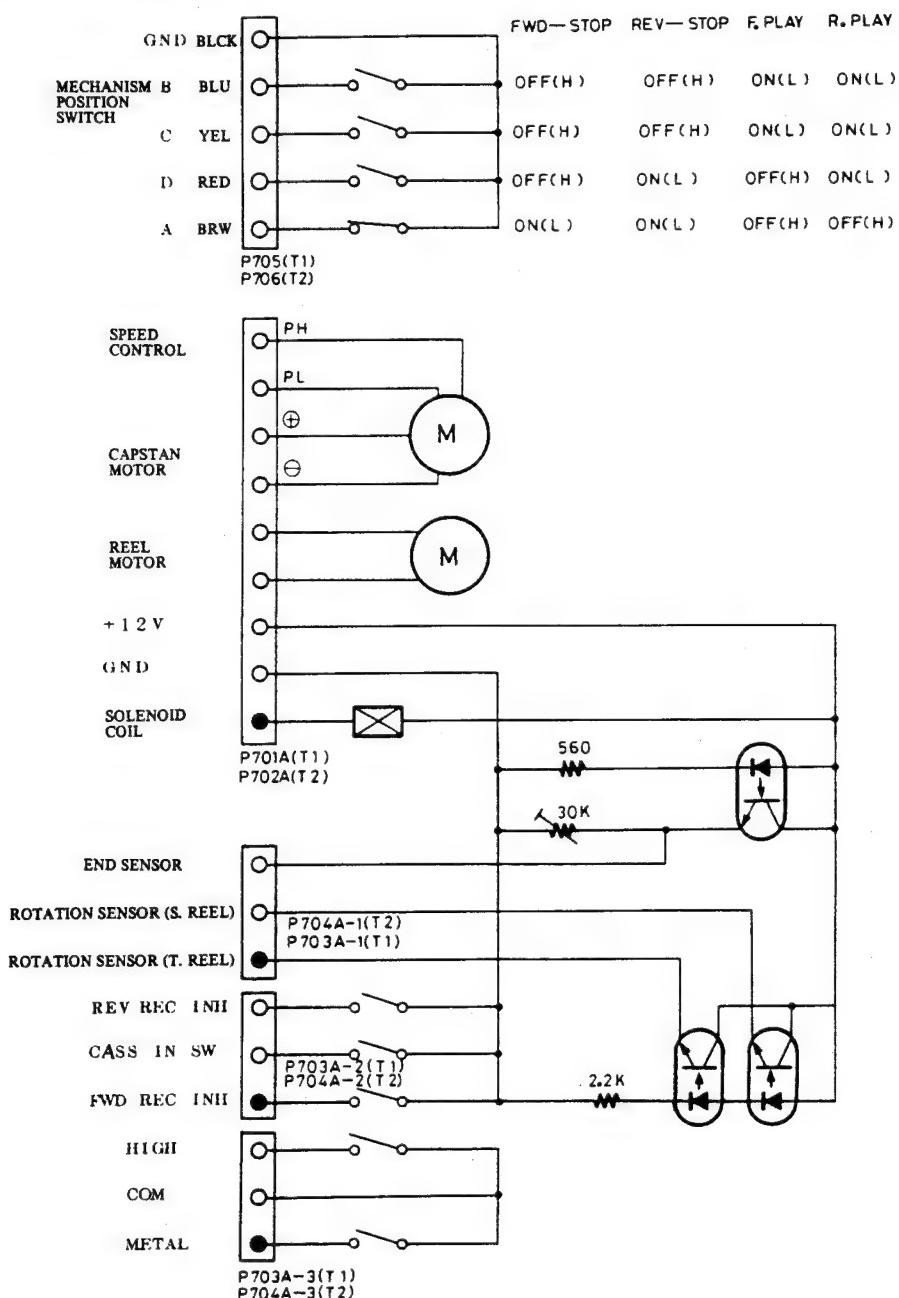


## NAMES AND FUNCTIONS OF MICROCOMPUTER PORTS

Port No.	Name	Function
1	T2 PAUSE	T2 pause display output (permits direct drive of LED or fluorescent display).
2	T2 REV. DIR	T2 reverse direction display output.
3	T2 FWD. DIR	T2 forward direction display output.
4	PRESET	Preset display output for music search.
5	(NOT USED)	Not used; always connected to Vcc.
6	X1 DUBBING	Dubbing display output for fluorescent display.
7	X2 DUBBING	High-speed dubbing display output for fluorescent display.
8	T2 REC. MUTE	T2 rec. muting output.
9	T1 REC. MUTE	T1 rec. muting output.
10	(NOT USED)	Not used.
11	LINE MUTE	Line muting output.
12	T2 REC./P.B	T2 recording/playback head switching output.
13	T1 REC./P.B	T1 recording/playback head switching output.
14	INPUT SEL.	Output for switching the playback signal input. H indicates T1 and L indicates T2.
15	X1 DUBBING	This output is H for normal speed dubbing and L at all other times.
16	DOLBY NR OFF	Output to turn Dolby NR off.
17	P-OFF	Input signal indicating that power has been detected; halts mechanism.
18	T2 OPTICAL END SENSOR	T2 tape-end input triggered when leader tape is detected (negative logic).
19	T1 OPTICAL END SENSOR	T1 tape-end input triggered when leader tape is detected (negative logic).
20	SEARCH SIG.	Signal input from search amplifier used for music search.
21	SEARCH SIG-LOW	Signal input from low-speed amplifier used for single repeat operation.
22	T2 ROTATION SENSOR	T2 head rotation pulse input for end-of-tape detection.
23	T1 ROTATION SENSOR	T1 head rotation pulse input for end-of-tape detection.
24	T2 REV.	Together with the signal from pin #25, this output signal controls the rotational direction of the reel motor.
25	T2 FWD.	Together with the signal from pin #24, this output signal controls the rotational direction of the reel motor.
26	T2 TRQ1	Together with the signal from pin #27, this output signal controls the torque of the reel motor.
27	T2 TRQ2	Together with the signal from pin #26, this output signal controls the torque of the reel motor.
28	T1 REV.	Together with the signal from pin #29, this output signal controls the rotational direction of the reel motor.
29	T1 FWD.	Together with the signal from pin #28, this output signal controls the rotational direction of the reel motor.
30	T1 TRQ1	Together with the signal from pin #31, this output signal controls the torque of the reel motor.
31	T1 TRQ2	Together with the signal from pin #30, this output signal controls the torque of the reel motor.
32	Vcc	Power supply terminal.
33	S-CLK	Clock output signal for sending mechanism status data to the real time counter.
34	SERIAL OUT	NRSC code output.
35	S-DATA	Mechanism status data output signal which is sent to the real time counter.
36	SERIAL IN	NRSC code input.
37	T2 SOL.	Mechanism T2 solenoid drive output (negative logic).
38	T1 SOL.	Mechanism T1 solenoid drive output (negative logic).
39	T2 CAPSTAN	T2 capstan on/off control output.
40	T1 CAPSTAN	T1 capstan on/off control output.
41	CAP. SPEED	Capstan speed control output for both T1 and T2. L selects normal speed; H selects high speed.
42	T2 BIAS	T2 bias oscillator control output. H turns oscillator on.
43	T1 BIAS	T1 bias oscillator control output. H turns oscillator on.
44	EXP. SELECT	Output to specify expander 1 or 2.
45 ~ 48	O <sub>0</sub> ~ O <sub>3</sub>	Signal input from expanders.
49	RESET	Microprocessor system reset input.

Port No.	Name	Function
50	TEST	Microprocessor internal check input. H indicates "normal."
51, 52	OSC1, OSC2	Terminal for clock oscillator.
53	GND	Ground terminal.
54 ~ 57	SD ~ SA	Expander selector output.
58	T1 REC	T1 record display output (permits direct drive of LED or fluorescent display).
59	T1 PLAY	T1 play display output (permits direct drive of LED or fluorescent display).
60	T1 PAUSE	T1 pause display output (permits direct drive of LED or fluorescent display).
61	T1 REV. DIR	T1 reverse direction display output (permits direct drive of LED or fluorescent display).
62	T1 FWD. DIR	T2 forward direction display output (permits direct drive of LED or fluorescent display).
63	T2 REC	T2 record display output (permits direct drive of LED or fluorescent display).
64	T2 PLAY	T2 play display output (permits direct drive of LED or fluorescent display).

## TAPE MECHANISM CONNECTION



# ADJUSTMENT PROCEDURES

## PRECAUTIONS

1. Before adjustment, clean the following parts with an alcohol moistened swab.
 

* record/playback head	* erase head
* pinch roller	* capstan
2. Do not use magnetized screwdriver for adjustments.
3. Demagnetize record/playback head with a head demagnetizer.

## TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator	
Digital frequency counter	
Oscilloscope	
Attenuator	
AC voltmeter	
Non-magnetic screw driver	
Test tapes	
VTT-658	: 10 KHz, -15dB
MTT-111	: 3 kHz, -10dB
MTT-150	: Dolby level calibration 400Hz, tone 200nWb/m

Item		Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	T1 Normal R727 T1 High R737 T2 Normal R728 T2 High R738	$3010 \pm 5\text{Hz}$ $6020 \pm 10\text{Hz}$ $3010 \pm 5\text{Hz}$ $6020 \pm 10\text{Hz}$	High speed connect the TP-7 to GND
2	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		VTT-658	PB	AC voltmeter	Head azimuth screw	Maximum and same phase at channels L and R	fig. 1
3	Playback level	AC voltmeter to terminals TP-1 and TP-2		MTT-150	PB	AC voltmeter	T1 R123 (Ch.L) T1 R124 (Ch.R) T2 R223 (Ch.L) T2 R224 (Ch.R)	245mV	
4	OSC Block	AC voltmeter to R507 (T1) and R557 (T2)		T1, T2 METAL TAPE MX-C60	T1, T2 REC	AC voltmeter	Z001 T1 Coil T2 Coil	Maximum	
5	HX-PRO	AC voltmeter to terminals TP-1, TP-2, TP-3 and TP-4		T1, T2 METAL TAPE MX-C60	T1, T2 REC	AC voltmeter	T1 L503 (Ch.L) T1 L504 (Ch.R) T2 L553 (Ch.L) T2 L554 (Ch.R)	Maximum	Bias VR R523, R524 R573, R574 maximum
6	Bias current	fig. 2	1kHz, -20dB and 12kHz, -20dB	XL-II C-90	REC/PB	AC voltmeter	T1 R523 (Ch.L) T1 R524 (Ch.R) T2 R573 (Ch.L) T2 R574 (Ch.R)	Same level at REC/PB	Input VR maximum
7	Record level	fig. 2	1kHz	XL-II C-90	REC	AC voltmeter	Attenuator or AF OSC output	350mV	
					REC/PB	AC voltmeter	T1 R401 (Ch.L) T1 R402 (Ch.R) T2 R451 (Ch.L) T2 R452 (Ch.R)	Same level at REC/PB	
8	Reverse operation sensitivity	DC voltmeter to sockets P703-1 (T1) #1 P704-1 (T2) #1		TDK AD-120 Magnetic substance	FWD PB	DC voltmeter	Semi-fixed VR (T-1, T-2) on the mechanism P.C.B.	2 ~ 2.5V	

### Blank tape

NORMAL ----- UD-1 C-90  
 HIGH ----- XL-II C-90  
 METAL ----- MX C-90

PLAY torque ----- 30 ~ 60 g/cm  
 FF. REW torque ----- 70 ~ 140 g/cm  
 Back tension ----- 2 ~ 5 g/cm

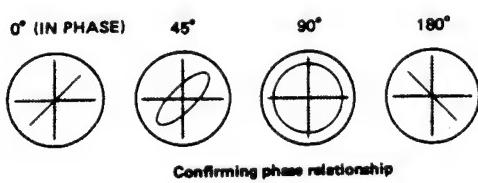
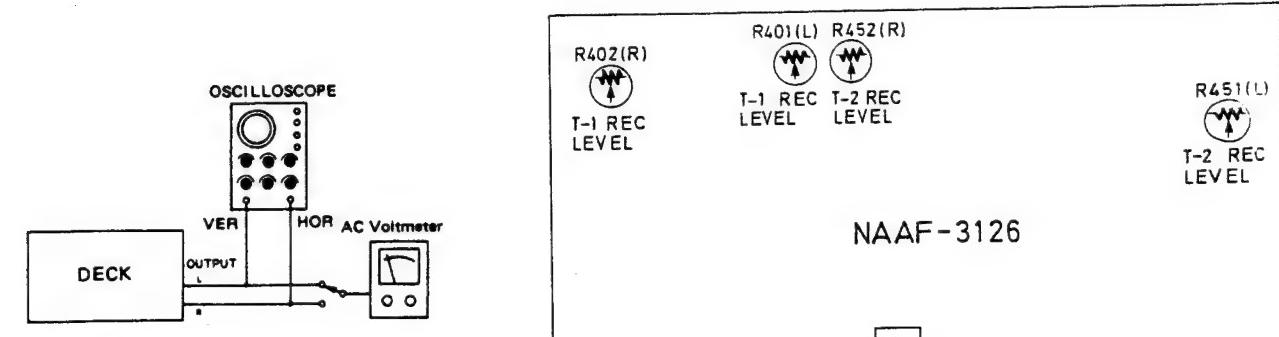
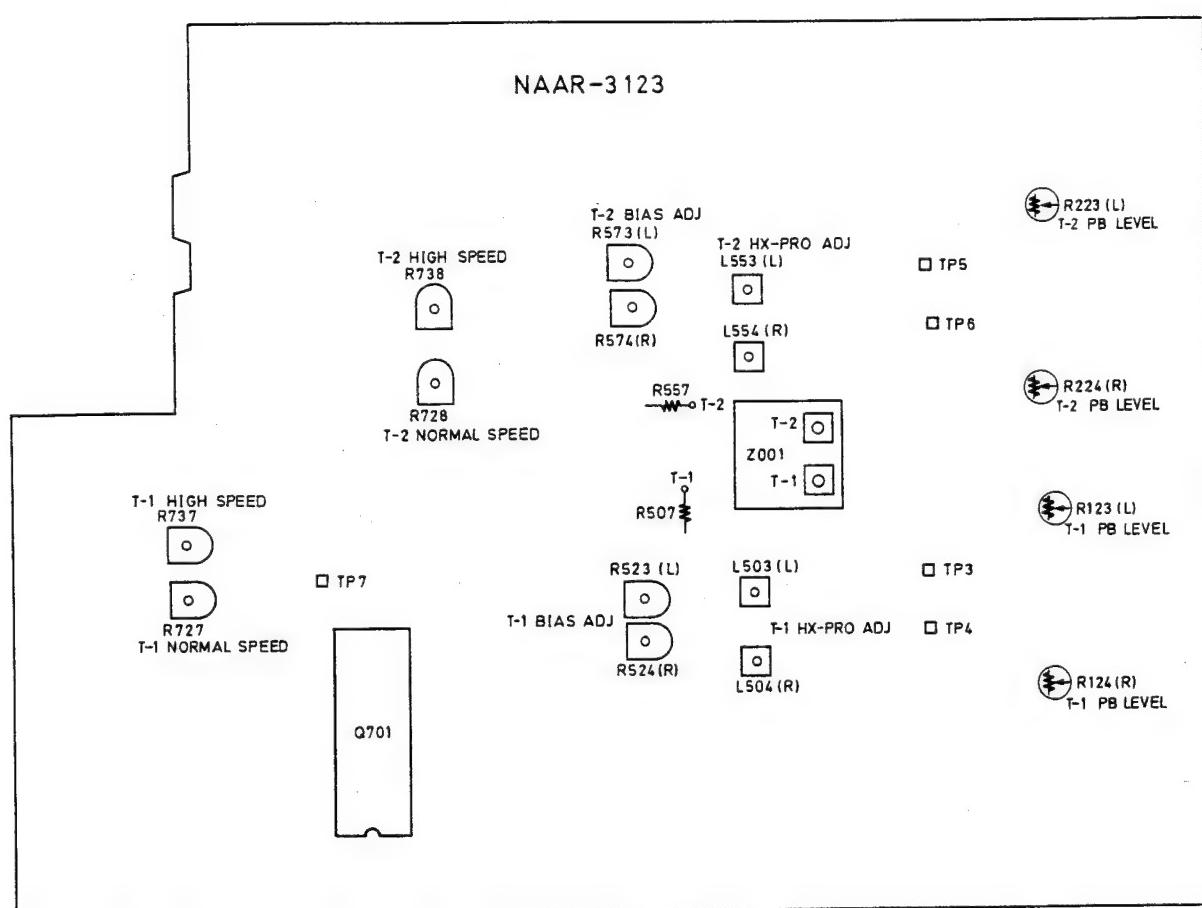


fig-1

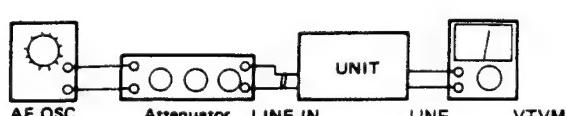
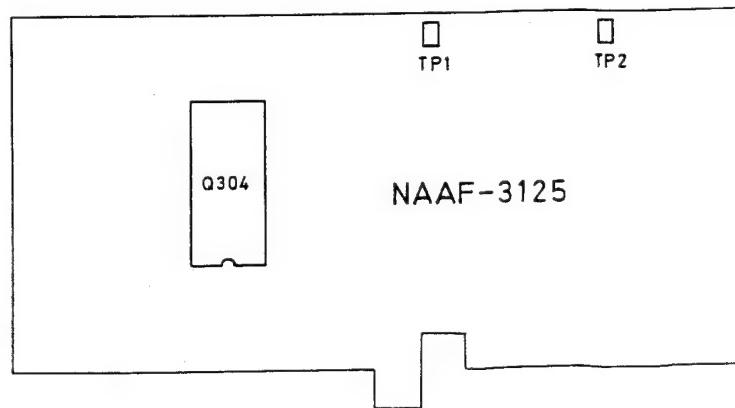


fig-2



# CHASSIS EXPLODED VIEW PART LIST

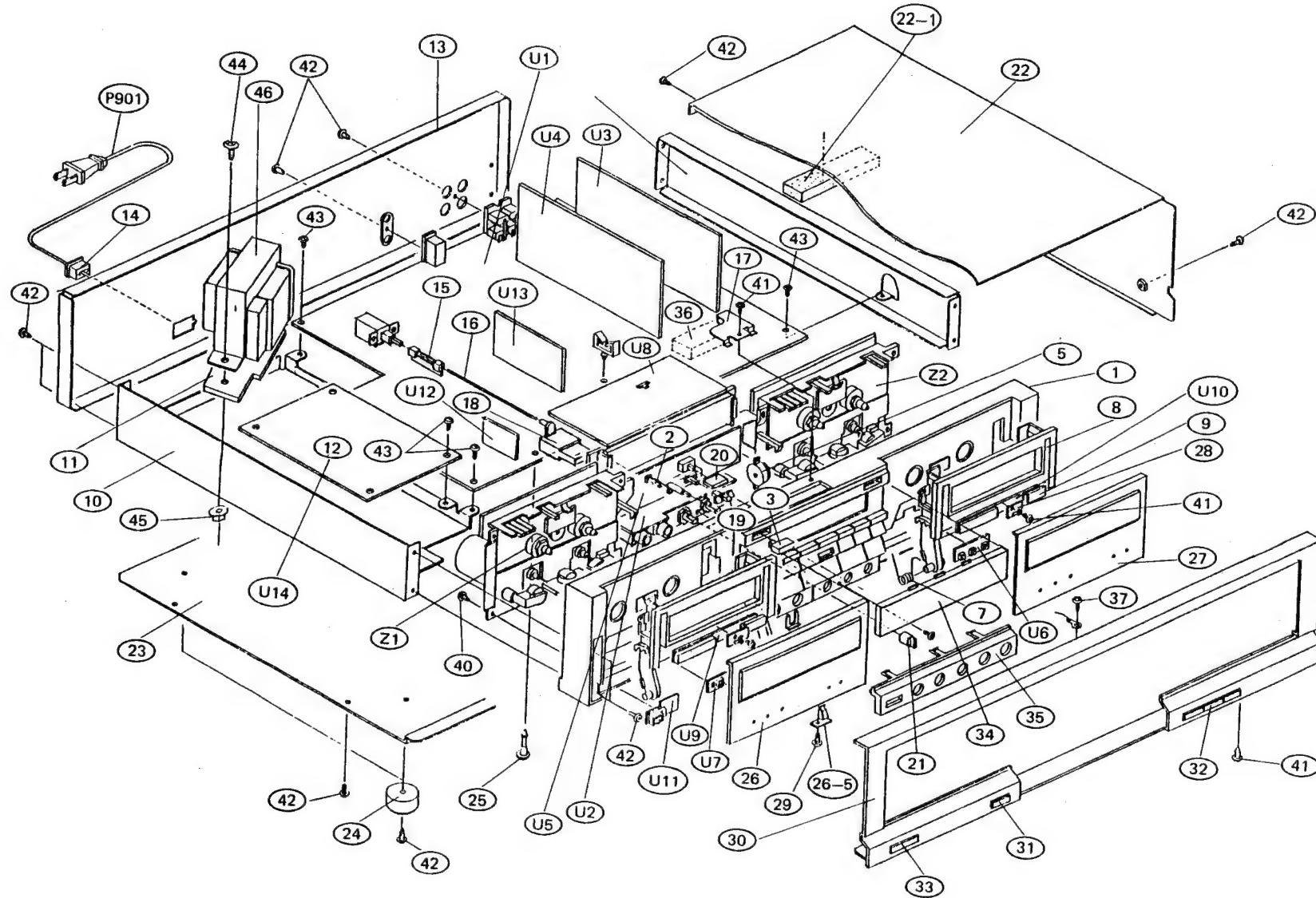
REF.NO.	PART NO.	DESCRIPTION
1	27110378	FRONT BRACKET AS
2	27273082	JOINT (EJECT)
3	28323149	KNOB (EJECT) L
4	28323150	KNOB (EJECT) R
5	28400282	DAMPER
6	27180314	SPRING (T1)
7	27180315	SPRING (T2)
8	28400339	FRAME AS (CASSETTE)
8-1	28400340	FRAME (CASSETTE)
8-2	27180272	SPRING (CA)
9	27190563	HOLDER (LED-5)
10	27130500	BRACKET (PT)
11	27270214A	SPACER
12	27115194-1	SIDE BRACKET
13	27121048	BACK PANEL (D)
	27121049	BACK PANEL (G)
	27121051	BACK PANEL (W)
14	27300750	BUSHING (CORD)
15	27273084	JOINT (POW)
16	27260084	SHAFT
17	27141158	BRACKET (FL)
18	28323151	KNOB (POW)
19	28323152	KNOB (MODE)
20	28323153	KNOB (RPT)
21	28323163	KNOB (DOLBY)
22	28184373	TOP COVER
22-1	28140798	CUSHION
23	27170243	BOTTOM BOARD
24	27175009A	LEG (S)
25	27190524	HOLDER
26	28400341A	CASSETTE LID AS (T1)
26-1	28400342	CASSETTE LID
26-2	28400343A	WINDOW (T1)
26-3	28400345	CASSETTE LID (T1)
26-4	28198688	FACET (DIR)
26-5	27180362	SPRING
27	28400344A	CASSETTE LID AS (T2)
27-1	28400342	CASSETTE LID
27-2	28400352A	WINDOW (T2)
27-3	28400345	CASSETTE LID (T1)
27-4	28198688	FACET (DIR)
27-5	27180362	SPRING
28	27141159	BRACKET
29	834230108	3TTS+10B(Ni)
30	1N027121A	FRONT PANEL

REF.NO.	PART NO.	DESCRIPTION
31	28323154	KNOB AS (AUTO)
32	28323156	KNOB AS (DUB)
33	28198689	FACET (HX)
34	28191437A	CLEAR PLATE
35	28400347	COSMETIC PLATE
36	28140805	CUSHION
37	834230088	3TTS+8B(Ni)
40	381430100	TAP-TIGHT SCREW 3TTW+10PBC
41	833430088	TAP-TIGHT SCREW 3TTP+8PBC
42	834430088	TAP-TIGHT SCREW 3TTS+8BBC
43	831130088	TAP-TIGHT SCREW 3TTW+8B
44	838440129	TAP-TIGHT SCREW 4TTB+12CBC
45	86414010	NUT FWN4+10FN
△ 46	2300265A	NPT-976D,POWER TRANSFORMER (D)
	2300266A	NPT-976G,POWER TRANSFORMER (G)
	2300267A	NPT-976DG,POWER TRANSFORMER (W)
	2300274A	NPT-976Q,POWER TRANSFORMER (Q)
△ P901	253112A	AS-UC-4,POWER SUPPLY CORD (D)
	253128B	AS-CEE,POWER SUPPLY CORD (G/W)
	253118	AS-SAA,POWER SUPPLY CORD (Q)
△ S902	25065123	NSS-1258P,VOLTAGE SELECTOR SWITCH (W)
Z1	244109A	CASSETTE DECK MECHANISM
Z2	244110A	CASSETTE DECK MECHANISM
U1	1N027523-1	NAAR-3123-1,MAIN PC BOARD ASS'Y (D)
	1N027523-1A	NAAR-3123-1A,MAIN PC BOARD ASS'Y (G/W)
U2	1N027524-1	NAAF-3124-1,MIC.VR.PC BOARD ASS'Y
U3	1N027525-1	NAAF-3125-1,DOLBY NR PC BOARD ASS'Y
U4	1N027526-1	NAAF-3126-1,REC AMP PC BOARD ASS'Y
U5	1N027527-1	NASW-3127-1
U6	1N027528-1	NASW-3128-1
U7	1N027536-1	NASW-3136-1
U8	1N027529-1	NADIS-3129-1,DISPLAY PC BOARD ASS'Y
U9	1N027530-1	NADIS-3130-1,TAPE-1 LED PC BOARD ASS'Y
U10	1N027531-1	NADIS-3131-1,TAPE-2 LED PC BOARD ASS'Y
U11	1N027532-1	NADIS-3132-1
U12	1N027533-1	NADG-3133-1,INPUT EXPANSION PC BOARD ASS'Y
U13	1N027534-1	NAETC-3134-1,SENSOR PC BOARD ASS'Y
U14	1N027535-1	NAETC-3135-1,POWER SUPPLY PC BOARD ASS'Y

NOTE: THE COMPONENTS IDENTIFIED BY MARK △ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

NOTE: (D): Only 120V model  
(G): Only 220V model  
(W): Only Universal model  
(Q): Only 240V model

## **CHASSIS EXPLODED VIEW**



# PRINTED CIRCUIT BOARD PART LIST

NAAR-3123-1 CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs		Q713,Q714	2213090	DTA114YS
Q181	222917	NJM-4558S-D (G/W)	Q715,Q716	2213170	2SD1809
Q509,Q559	222959	$\mu$ PC1297CA	Q717,Q718	2212304 or 2211945	2SK381-D or 2SK246GR
Q605	222465	NJM-4558D		221282	DTC144ES
Q606	222681 or 222695	IR-3702 or LA-6324	Q719,Q720 Q721,Q722	221282	DTC144ES
Q607	222652	M5218L	Q725,Q726	2211255 or 2210746	2SC1815GR or 2SC945-A-P
Q701	22240089	HD-614088S-B53		2201285 or 2201286	2SD882-Q or 2SD882-P
Q702	222810	LC-7800	Q727,Q728	2211455 or 2212495	2SA1015-GR or JA101Q
Q723,Q724	222953	M-5454AL	Q729,Q731	221255 or 2210746	2SC1815GR or 2SC945-A-P
	Transistors		Q730		
Q101-Q104	2211896 or 2211406	2SC1815LL or 2SC2240-BL			
Q105-Q108	2211255 or 2210746	2SC1815GR or 2SC945-A-P			
Q151,Q152	2212794 or 2212795	2SD1468-R or 2SD1468-S	D101	223163	ISS133
Q183,Q184	2212304 or 2211945	2SK381-D or (G/W) 2SK246-GR	D104	223150, 223124 or 223145	US1040, (G/W) 1S2473 or 1S2076TD
Q185	221281	DTC114YS (G/W)	D105,D106	223163	ISS133 (G/W)
Q201-Q204	2211896 or 2211406	2SC1815LL or 2SC2240-BL	D501	223163	ISS133
Q205,Q206	2211255 or 2210746	2SC1815GR or 2SC945-A-P	D502	2243253, 2239673 or 224651503	MTZ-15C, RD15E-B3 or HZ-15E-B3
Q207,Q208	2212794 or 2212795	2SD1468-R or 2SD1468-S	D503	223150, 223124 or 223145	US1040, 1S2743 or 1S2076TD
Q501	2211455 or 2212495	2SA1015-GR or JA101Q	D504,D505	223163	ISS133
Q502	2201540	2SD947	D509	223163	ISS133
Q503	221281	DTC114YS	D551	223163	ISS133
Q504-Q506	2211455 or 2212495	2SA1015-GR or JA101Q	D552	2243253, 2239673 or 224651503	MTZ-15C, RD15E-B3 or HZ-15E-B3
Q507,Q508	221281	DTC114YS		223163	ISS133
Q551	2211455 or 2212495	2SA1015-GR or JA101Q	D553,D554 D555-D559	223150, 223124 or 223145	US1040, 1S2473 or 1S2076TD
Q552	2201540	2SD947		223163	ISS133
Q553	221281	DTC114YS		223163	ISS133
Q554-Q556	2211455 or 2212495	2SA1015-GR or JA101Q	D601	223150, 223124 or 223145	US1040, 1S2473 or 1S2076TD
Q557,Q558	221281	DTC114YS	D602-D604	223163	ISS133
Q601	221281	DTC114YS		223150, 223124 or 223145	US1040, 1S2473 or 1S2076TD
Q602	2211455 or 2212495	2SA1015-GR or JA101Q	D605	2243152	MTZ-5.6B
Q603,Q604	221281	DTC114YS		2239472 or 224650562	RD5.6E-B2 or HZ-5.6E-B2
Q609,Q610	2211255 or 2210746	2SC1815GR or 2SC945-A-P	D606,D607 D608,D609	223163	ISS133
Q703	2211455 or 2212495	2SA1015-GR or JA101Q	D701	223163	ISS133
Q704,Q705	221281	DTC114YS	D703,D704	223150, 223124 or 223145	US1040, 1S2473 or 1S2076TD
Q706	221282	DTC144ES		223163	ISS133
Q707	2213090	DTA114YS	D705-D707	223163	MTZ-5.6A,
Q708,Q709	221281	DTC114YS	D708	2243151, 2239471 or 224650561	RD5.6E-B1 or HZ-5.6E-B1
Q710	221281	DTC114YS		223150, 223124 or 223145	US1040, 1S2473 or 1S2076TD
Q711,Q712	2212853, 2212855, 2212845 or 2212846	2SB1068-K, 2SB1068-U, 2SB598-E or 2SB598-F	D709,D710	2241291 or 224650331	RD3.3EB1 or HZ-3.3E-B1

# PRINTED CIRCUIT BOARD PART LIST

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
	Coils				
L101,L102	231091	NCH-2139	R737,R738	5215044	N08HR 5KBC
L501,L502	231077 or	NCH-2125 or	R739,R740	4000115	LT3600 1/4S 1.8K
	231025	NCH-1064	R767	49163392404	3.9k×4,1/10W,NETWORK
L503,L504	231127	NCH-4183	R768	49163392412	3.9k×12,1/10W,NETWORK
L551	231077 or	NCH-2125 or			
	231025	NCH-1064			
L553,L554	231127	NCH-4183	P101	25055102	NPLG-5P86
Z001	231113	NOB-037	P105-P107	25055133	NPLG-3P117
X701	3010118	CSA-3.00MG	P201	25055102	NPLG-5P86
			P301	25055065	NPLG-5P51
			P302	25055047	NPLG-12P35
	Capacitors		P401	25055066	NPLG-7P52
C105,C106	392880337T	3.3 μF50V,LL	P402	25055067	NPLG-9P53
C111,C112	354741009T	10μF16V,ELECT.	P501,P551	25055100	NPLG-3P84
C113,C114	354742209T	22μF16V,ELECT.	P601	25055148	NPLG-4P132
C123,C124	354744709T	47μF16V,ELECT.	P602,P604	25055133	NPLG-3P117
C181,C182	354741009T	10μF16V,ELECT. (G/W)	P705,P706	25055135	NPLG-5P119
C185,C186	354780229T	2.2 μF50V,ELECT. (G/W)	P707	25055149	NPLG-5P133
C187,C188	354741009T	10μF16V,ELECT. (G/W)	P709	25055147	NPLG-3P131
C203,C204	392880337T	3.3 μF50V,LL	P710,P711	25055187	NPLG-6P171
C209,C210	354741009T	10μF16V,ELECT.	P712	25055183	NPLG-2P167
C211,C212	354742209T	22μF16V,ELECT.	P713	25055258	NPLG-6P241
C217,C218	354744709T	47μF16V,ELECT.	P714,P716	25055183	NPLG-2P167
C501,C502	354744709T	47μF16V,ELECT.	P723	25045172	HSJ-1003-01-020
C505	354780479T	4.7 μF50V,ELECT.	P724	25055146	NPLG-2P130
C506	354722219S	220 μF 6.3V,ELECT.			
C509,C510	370131814	180PF 100V,APS			
C511,C512	370131014	100PF 100V,APS			
C521,C522	354741009T	10μF16V,ELECT.	P104	25050064	NSCT-5P18,DIN (G/W)
C551	354744709T	47μF16V,ELECT.	P701A	2000759	NSAS-18P715
C552	354780479T	4.7 μF50V,ELECT.	P702A	2000740	NSAS-18P696
C556	354722219T	220 μF 6.3V,ELECT.	P703A	2000761	NSAS-18P717
C559,C560	370131814	180PF 100V,APS	P704A	2000762	NSAS-18P718
C561,C562	370131014	100PF 100V,APS	P911A	2000760A	NSAS-12P716
C571,C572	354741009T	10μF16V,ELECT.	P912A	2000398	NSAS-12P357
C573,C574	354742209T	22μF16V,ELECT.			
C601,C603	354780479T	4.7 μF50V,ELECT.			
C602	354744709T	47μF16V,ELECT.	RL101,RL201	25065174	NRL2P1A-DC12-09
C604,C605	354780109T	1 μF50V,ELECT.			
C606	354782299T	0.22μF50V,ELECT.			
C607	354741009T	10μF16V,ELECT.	P901	25035559	NPS-111L521P,PUSH
C609	354786899T	0.68μF50V,ELECT.			
C610-C614	354741009T	10μF16V,ELECT.			
C703	354780229T	2.2 μF50V,ELECT.	25060092		NTM-1S33,TERMINAL
C704	354741009T	10μF16V,ELECT.	27160029-1		RAD-07B,RADIATOR
C711,C712	354742219T	220 μF16V,ELECT.	82143006		3P+6FNBC,SCREW
C715	354744709T	47μF16V,ELECT.	27300243		WS-2W,CLAMP
C725	354741009T	10μF16V,ELECT.	27300601		SB-1925,COVER (G/W)
C901	3500065A	0.01μF400VAC,IS	P102	25045142	NPJ-4PDBL55
	Resistors				
R123,R124	5210122	N06HR 50KBC			
R223,R224	5210122	N06HR 50KBC			
R523,R524	5215044	N08HR 5KBC			
R573,R574	5215044	N08HR 5KBC			
R725,R726	441722704	27Ω,2W,OXIDE-FILM			
R727,R728	5215044	N08HR 5KBC			
R731-R734	4000112, 4000118 or 4000119	TD5-A090D, TSD-090 or SDT-09,THERMISTOR			

## NOTE

G : Only 220V model

W : Only Universal model

# PRINTED CIRCUIT BOARD PART LIST

<b>NAAF-3124-1</b>		<b>CIRCUIT NO.</b>	<b>PARTS NO.</b>	<b>DESCRIPTION</b>	<b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
	Ics					Socket,Plug	
Q153,Q171	222811 or 222502			NJM4558-DD or NJM4558-DX	P301 P302 P303,P304	25050130 25050219 25055317	NSCT-5P32 NSCT-12P47 NPLG-3P300
	Capacitors						
C171	354783399S			0.33 $\mu$ F50V,ELECT.	<b>NAAF-3126-1</b>	<b>CIRCUIT NO.</b>	<b>PARTS NO.</b>
C173	354780109S			1 $\mu$ F50V,ELECT.	Q403	Ics	BA4558 or NJM-4558D
C174,C175	354741009S			10 $\mu$ F16V,ELECT.	Q404	222921 or 222465	BA6251
	Resistors				Q455	222918	M5218P
R155	5104213			N09R250KW15F,VARIABLE	Q456	222808	TD-62554S
R156	5104214			N09R2L50kA15F,VARIABLE	Q457,Q458	222919	BA6251
	Miscellaneous					222918	
P103	25045130			HLJ4308-01-010,MIC.JACK			
P105A	2000521			NSAS-6P477,SOCKET	D506-D508	Diodes	1SS133
P106A	2000522			NSAS-6P478,SOCKET		Transistors	
P107A	2000428			NSAS-6P387,SOCKET	Q401,Q402	2212794 or 2212795	2SD1468-R or 2SD1468-S
P601A	2000754			NSAS-8P710,SOCKET	Q451,Q452	2212794 or 2212795	2SD1468-R or 2SD1468-S
P602A	2000524			NSAS-6P480,SOCKET	Q453,Q454	2211255 or 2210746	2SC1815GR or 2SC945-A-P
P603	25045187			HLJ0541-01-010,HEADPHONE			
S601	25030295 27141160A			NRSF-223-15MP,SWITCHS,DOL. BRACKET(VR)			
						223163	
<b>NAAF-3125-1</b>		<b>CIRCUIT NO.</b>	<b>PARTS NO.</b>	<b>DESCRIPTION</b>			
	Ics					Coils	
Q301	222933 or 222840661			BU-4066B or 4066B	L401,L402	231086, 24606070 or	NCH-2134, NCH1008 or
Q302	222917			NJM-4558S-D		231041	NCH2081
Q304	222999			CX-20187	L403,L404	231083,	NCH-2131, NCH-1022 or
Q305	222917			NJM-4558S-D		24606080 or	NCH-2078
Q306	222933 222840661			BU-4066B 4066B	L405,L406 L451,L452	231038 233314 231086, 24606070 or	NCH-2097 NCH-2134, NCH1008 or
	Transistors					231041	NCH2081
Q303	221282			DTC144ES	L453,L454	231083, 24606080 or	NCH-2131, NCH-1022 or
Q307	221282			DTC144ES		231038	NCH-2078
	Diodes				L455,L456	231080, 233191 or	NCH-2128, NCH-1036 or
D931,D932	2243183 or 2239533			MTZ-7.5C or RD7.5E-B3		231035	NCH-2075
	Coils				L457,L458	231083, 24606080 or	NCH-2131, NCH-1022 or
L301,L302	233313 or 233306			NMC6048 or NMC6043		231038	NCH-2078
L303,L304	233353 or 233382			NMC-2058 or NMC-2069	L459,L460	233314	NCH-2097
	Capacitors						
C301-C304	352980226S			2.2 $\mu$ F 50V,NP	C401,C402	354741009T	10 $\mu$ F16V,ELECT.
C305,C306	352950476S			4.7 $\mu$ F 25V,NP	C403,C404	354781099T	0.1 $\mu$ F50V,ELECT.
C327-C330	354780479T			4.7 $\mu$ F50V,ELECT.	C405,C406	354780479T	4.7 $\mu$ F50V,ELECT.
C331,C332	354741009T			10 $\mu$ F16V,ELECT.	C453,C454	354741009T	10 $\mu$ F16V,ELECT.
C335	354780479T			4.7 $\mu$ F50V,ELECT.	C455,C456	354781099T	0.1 $\mu$ F50V,ELECT.
C931,C932	354741019T			100 $\mu$ F16V,ELECT.	C457,C458	354780479T	4.7 $\mu$ F50V,ELECT.
C933,C944	354744709T			47 $\mu$ F16V,ELECT.			
	Resistors				R401,R402	5215033 or 5215013	N08HR 150KBC or N08HR 100KBA
					R451,R452	5215033 or	N08HR 150KBC or

# PRINTED CIRCUIT BOARD PART LIST

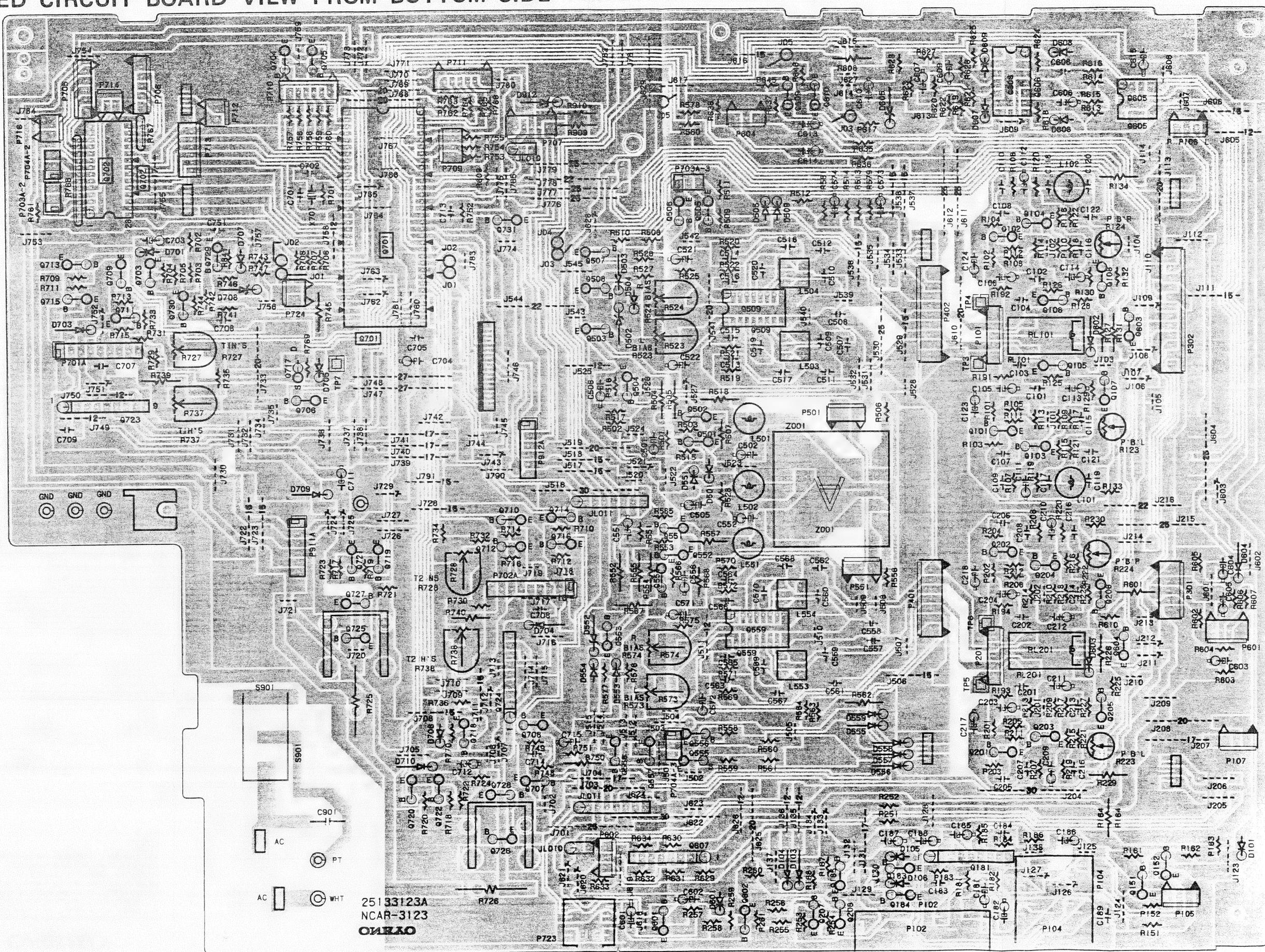
<b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>	<b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
	5215013	N08HR 100KBA	P604A	2000652	NSAS-6P608
	Miscellaneous		P707A	2000649	NSAS-10P605
P401	25050132	NSCT-7P34,SOCKET	P708A	2000798	NSAS-10P754
P402	25050217	NSCT-9P45,SOCKET	P709A	2000600	NSAS-6P556
P403,P404	25055317	NPLG-3P300,PLUG	P724A	2000781	NSAS-4P737
				Plug	
			P721	25055150	NPLG-6P134
<b>NASW-3127-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>			
D721-D724	Diodes			Holder	
	223163	1SS133		27190564	HOLDER(FL)
	Switch		<b>NADIS-3130-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
S701	25065325	NSS-23128	D731	225192	GL1NG1
S702	25035548	NPS-111S510,PUSH	D732,D733	225190	GL1PR1
S703-S706	25035548	NPS-111S510,PUSH			
S707	25035570	NPS-111S532,PUSH			
S708-S712	25035548	NPS-111S510,PUSH	P710A	2000739	NSAS-12P695
S713-S719	25035570	NPS-111S532,PUSH			
S720	25035399	NPS-122L364,PUSH			
	Socket		<b>NADIS-3131-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
P719A	20004782	NSAS-14P738	D736	225192	GL1NG1
P720A	2000603	NSAS-12P559	D737,D738	225190	GL1PR1
P721A	2000758	NSAS-12P714	D739,D740	225192	GL1NG1
<b>NASW-3128-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>			
S721-S723	Switch			Socket	
	25035548	NPS-111S510,PUSH	P717A	2000738A	NSAS-12P694
	Socket		<b>NADIS-3132-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
P722A	2000515	NAAS-8P471	D741	225192	GL1NG1
<b>NADIS-3129-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>			
	Ics			Socket	
Q611,Q612	22240087 or 22240088	BA6137 or LB1423N	P716A	2000736	NSAS-4P692
Q615	222687	LB1241		Holder	
Q751,Q752	22240084	HD614128S-A41		27190566	HOLDER(LED-1)
	Transistors		<b>NADG-3133-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
Q613,Q614	2212600	DTA124ES	Q740	Ic	
Q754,Q755	2211255 or 2210746	2SC1815GR or 2SC945AP		222810	LC7800
	Display tube				
Q753	212049	BG-485G	C726	Capacitors	
	Xtal			354741009T	10 $\mu$ F16V,ELECT.
X731	3010118 or 3010129	CSA3.00MG or PRS-3.00RM03	R801	Resistors	3.9k $\times$ 4,1/10W,NETWORK
			R802	49163392404	3.9k $\times$ 12,1/10W,NETWORK
				49163392412	
	Capacitors				
C615,C616	354741009T	10 $\mu$ F16V,ELECT.	P713A	Socket	NSCT-6P129
C733	354741009T	10 $\mu$ F16V,ELECT.			
C734	354761009T	10 $\mu$ F35V,ELECT.			
	Socket		P719	Plugs	
			P720	25055229	NPLG-7P213
				25055228	NPLG-6P212

## PRINTED CIRCUIT BOARD PART LIST

CIRCUIT NO.	PART NO.	DESCRIPTION	CIRCUIT NO.	PART NO.	DESCRIPTION
P722	25055226	NPLG-4P210		Resistors	
P717,P718	25055317	NPLG-3P300	R901	442524794	RS1/2WBJ 0.47 Ω,OXIDE-FILM
			R902	442520224	RS1/2WBJ 2.2Ω,OXIDE-FILM
			R903	442524714	RS1/2WBJ 470Ω,OXIDE-FILM
<b>NAETC-3134-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>	R904	441723904	RS 2 WBJ 39 Ω, OXIDE-FILM
			R908	442520104	RS1/2WBJ 1.0Ω,OXIDE-FILM
<b>Q736</b> <b>Q737</b>	222740045	74HC04P		Plugs	
	222465	NJM4558D	P911,P912	25055136	NPLG-6P120
<b>Q732-Q735</b>	<b>Transistors</b>	2SC1815GR or 2SC945AP		Miscellaneous	
				27160271-1	RAD-68B,RADIATOR
<b>D711,D712</b>	<b>Diodes</b>	US1040, 1S2473 or 1S2076TD		27160029	RAD-07,RADIATOR
				82143006	3P+6FN(BC),SCREW
<b>C716,C717</b> <b>C722,C723</b>	<b>Capacitors</b>	0.22μF50V,NP. 10μF16V,ELECT	<b>NASW-3136-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
			S724	Switch 25035548	NPS-111S510,PUSH
<b>P703-1,P704-1</b> <b>P708</b> <b>P715</b>	<b>Plugs</b>	NPLG-3P117 NPLG-5P133 NPLG-9P306	P712A	Socket 2000736	NAAS-4P692
<b>NAETC-3135-1</b> <b>CIRCUIT NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>			
<b>Q901</b> <b>Q902</b> <b>Q905</b>	<b>Ics</b>	78M12 79M12 78M05			
<b>Q903</b>	<b>Transistors</b>	2SB772P or 2SB772Q			
<b>Q904</b>	<b>Transistors</b>	2SD882P or 2SD882Q			
<b>D901-D904</b> <b>D905-D907</b> <b>D908,D909</b> <b>D910</b>	<b>Diodes</b>	1N4002F RL152 1SS133 MTZ13B, RD13EB2 or HZ13EB2			
<b>C902,C903</b> <b>C904</b> <b>C905</b> <b>C906</b> <b>C907,C908</b> <b>C909</b> <b>C910</b> <b>C911</b> <b>C912-C914</b>	<b>Capacitors</b>	1000μF25V,ELECT. 0.1 μF50V,ELECT. 1 μF50V,ELECT. 1000μF25V,ELECT. 47μF16V,ELECT. 22000 μF25V,ELECT. 0.22μF50V,ELECT. 0.1 μF50V,ELECT. 4.7 μF50V,ELECT.			

## PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

NCAR-3123



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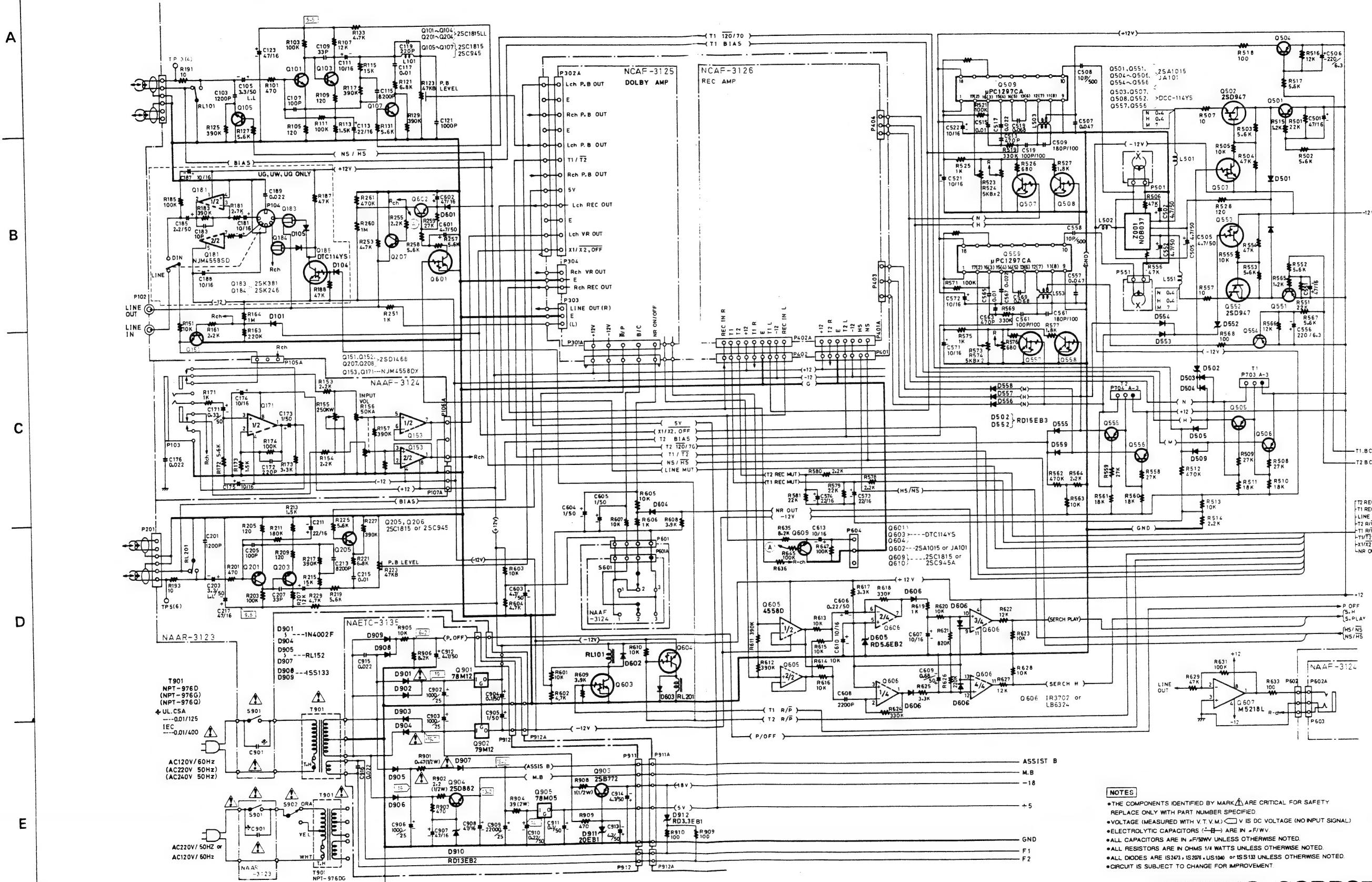
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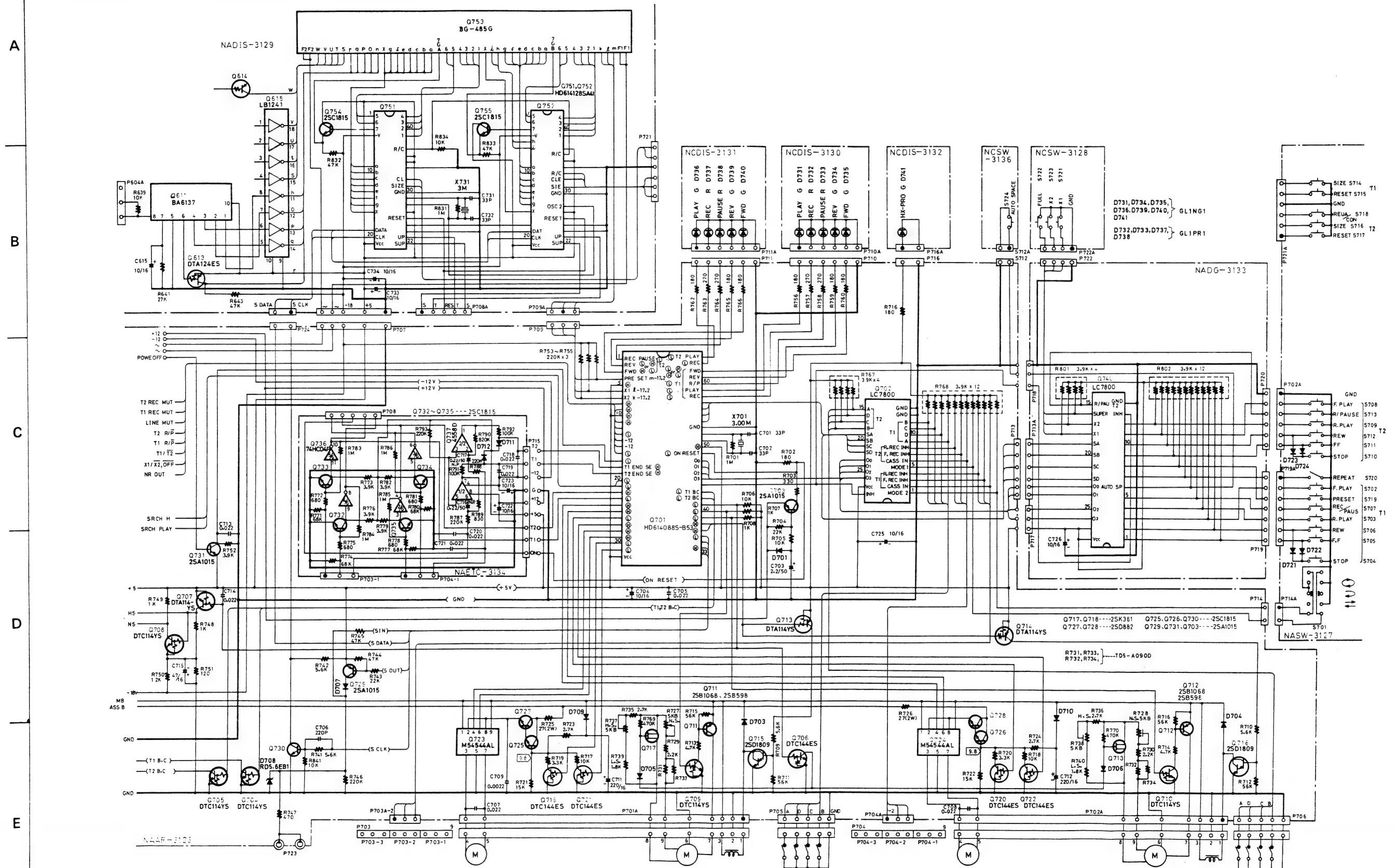
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## SCHEMATIC DIAGRAM (AUDIO SECTION) 1/3



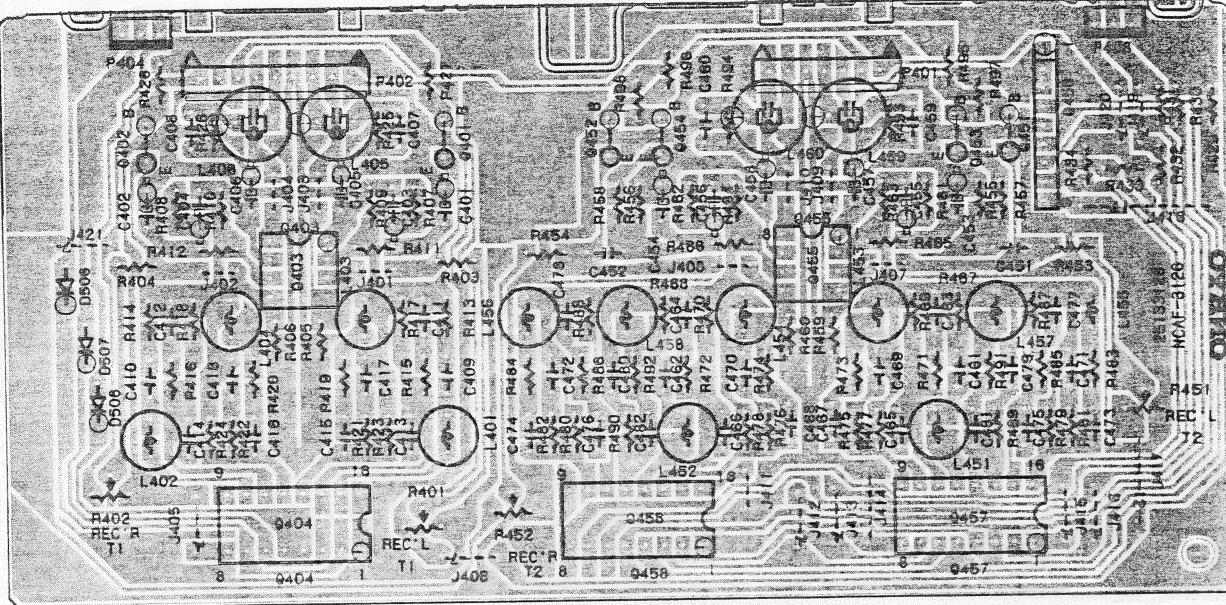
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SCHEMATIC DIAGRAM (CONTROL SECTION) 2/3

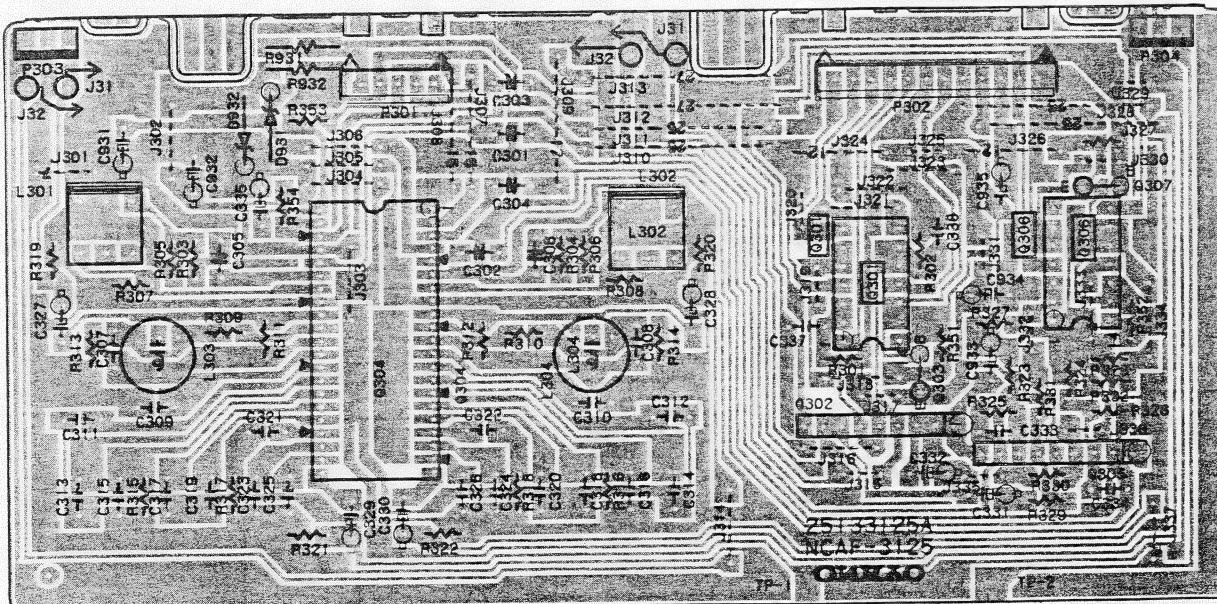


PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

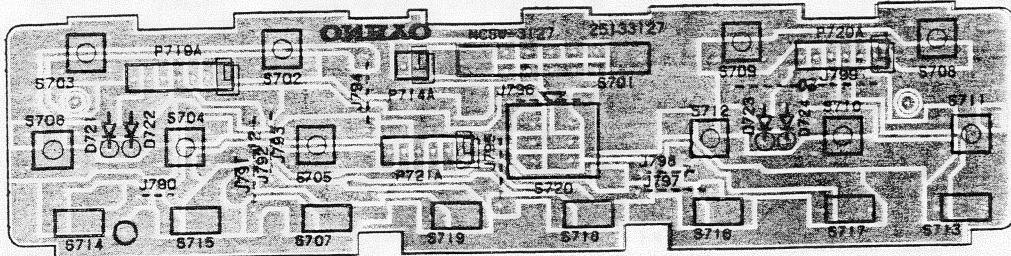
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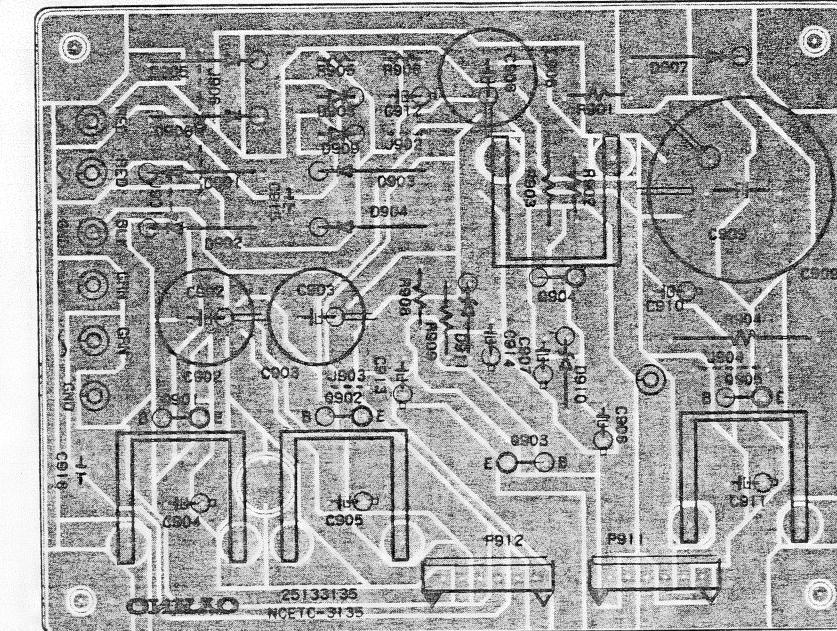
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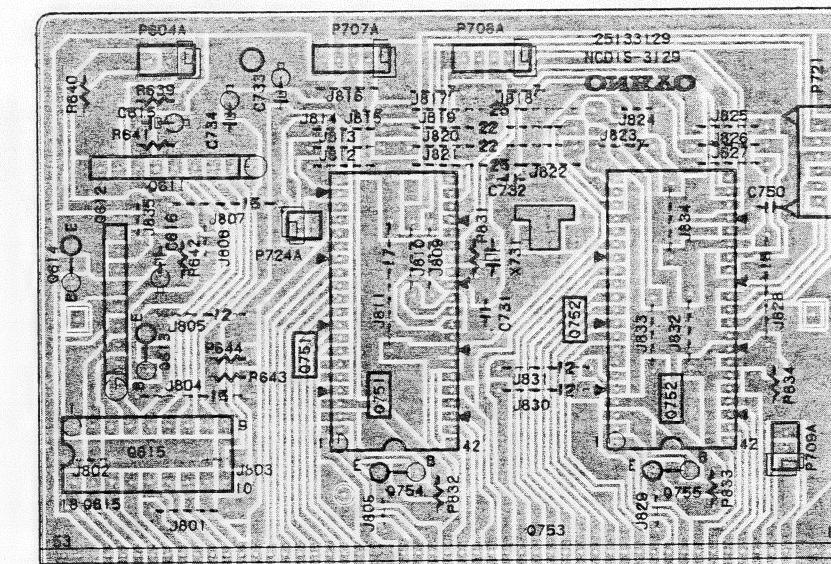
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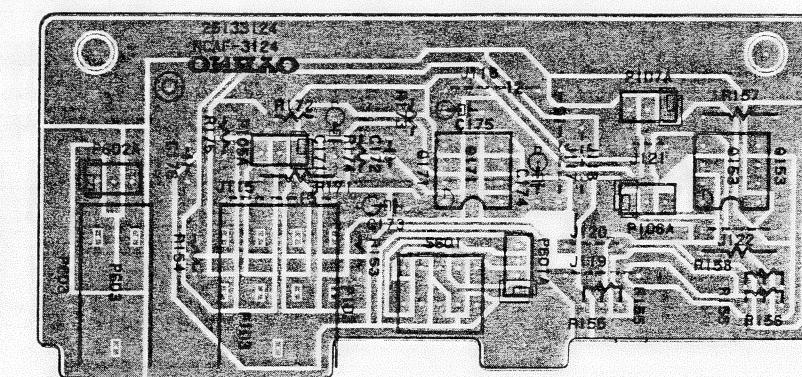
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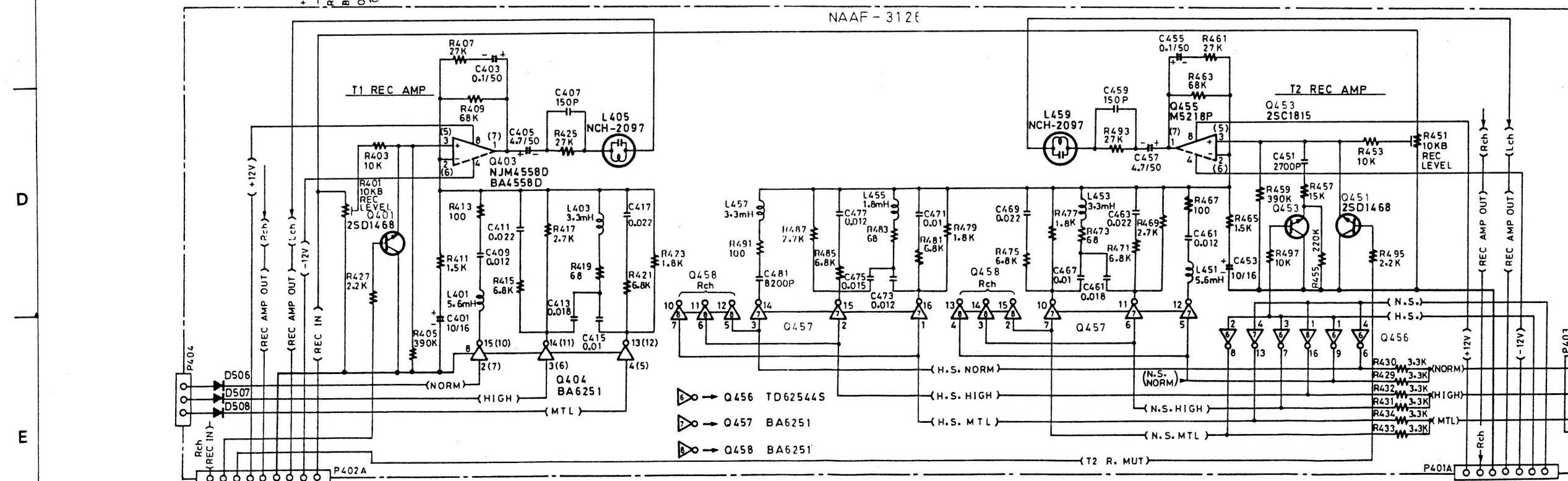
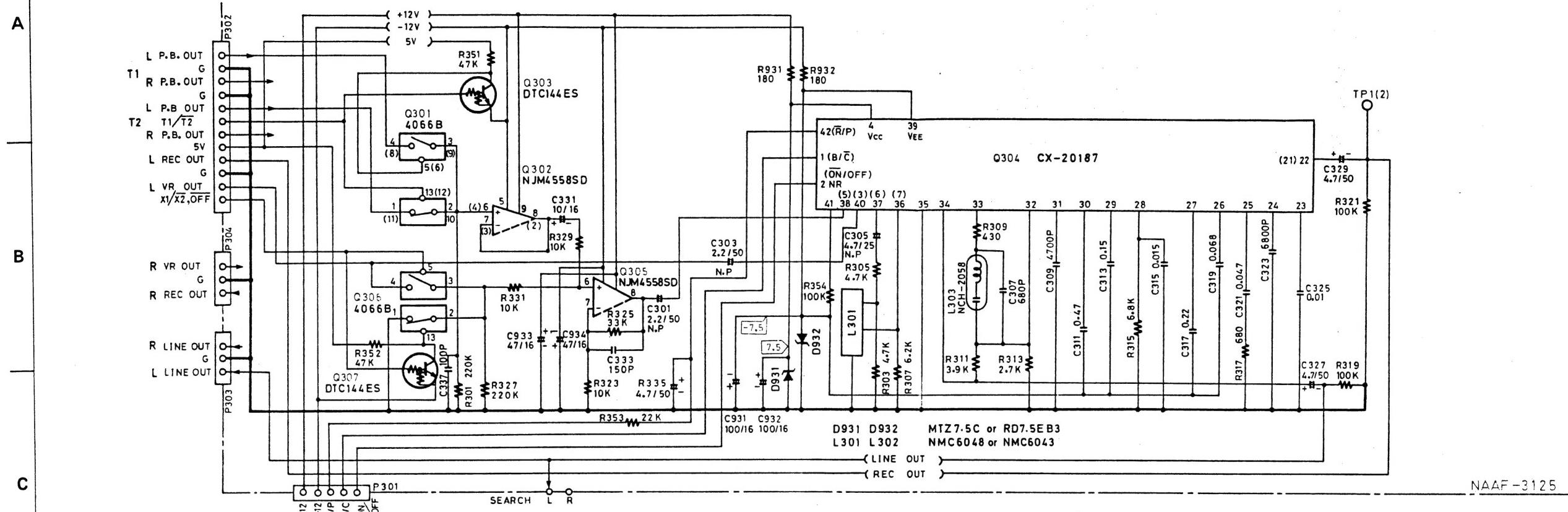


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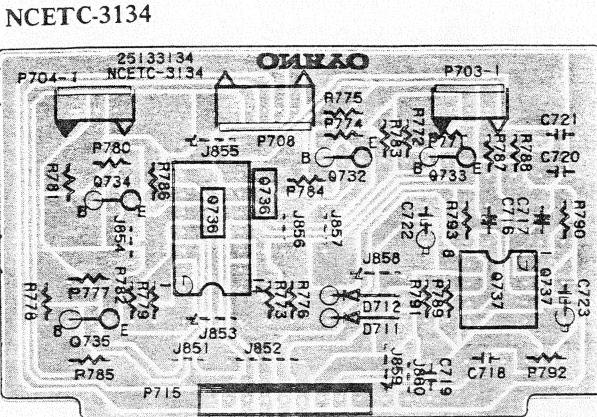


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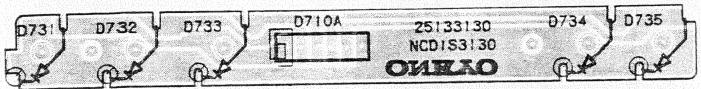
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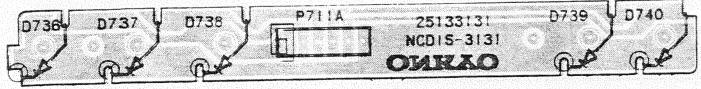
## TAPE MECHANISM-PART LIST



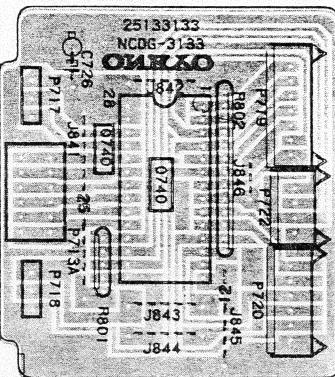
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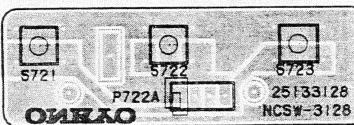
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NCDG-3133



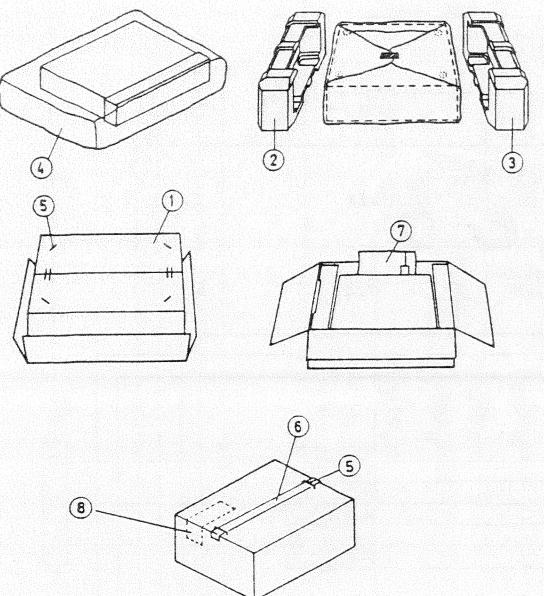
NCSW-3128



NCDIS-3132



## PACKING VIEW



## NOTE

N : Only USA model  
W : Only 120/220V model  
I : Only Italy model

D MODEL

REF NO.	PART NO.	DESCRIPTION
1	29051612	Master Carton Box
2	29091204	Pad (L)
3	29091205	Pad (R)
4	29100034A	850 X 650 Poly Bag
5	282301	Sealing hook
6	260012	Damplon tape
7	Accessory bag ass'y	
	29341197	Instruction manual
	2010098A	Connection cable
	29365019	Waranty card (N)
	29358002E	Service station list (N)
	29100006A	350 X 250 Poly bag

G/W MODEL

<b>REF NO.</b>	<b>PART NO.</b>	<b>DESCRIPTION</b>
1	29051612	Master carton box
2	29091204	Pad (L)
3	29091205	Pad (R)
4	29100034A	850 X 650 Poly bag
5	282301	Sealing hook
6	260012	Damplon tape
7	Accessory bag ass'y	
	29341198	Instruction manual
	29341199	Instruction manual (I)
	2010095	Connection cable
	25055018	Conversion plug (CV-K-2) (W)
	29100006A	350 X 250 Poly bag

TAPE-1

REF.NO.	PART NO.	DESCRIPTION
1	24610673	WASHER
2	24611295	WASHER 2.2+7+0.8
3	24611325	MECHANISM CHASSIS
4	24602432	ASSIST GEAR
5	24602433	CAM
6	24606282	CONTACT
7	24611337	WASHER 7+8+.5
8	82112003	PAN-HEAD SCREW M2+3
9	24606283	CONTROL P.C.B.
10	24611294	WASHER 2.3+4.7+0.5
11	24602446	FLYWHEEL AS
12	82112003	PAN-HEAD SCREW M2+3
13	24611148	WASHER 2.6+4.7+0.5
14	24602435	FLYWHEEL
15	24602436	BELT
16	24611326	THRUST SPRING
17	82112603	PAN-HEAD SCREW 2.6P+
18	24611327	BRACKET (MOTOR)
19	24601231	CAPSTAN MOTOR AS
21	833126082	TAPPING SCREW M2.6+8
22	24603349	LEVER (SLIDE)
23	24611336	REFLECTOR
25	24602437	PINCH ROLLER AS (L)
29	24609010	SPECIAL SCREW M2+3
30	24602440	GEAR
31	24605668	SPRING
32	24602441	GEAR (HEAD)
33	24604089	SHAFT (HEAD BASE)
34	24611328	HEAD BASE AS
35	24605669	SPRING
36	24609009	ADJUSTING SCREW
37	24611329	BRACKET AS (HEAD)
38	24600074	HEAD
39	82111406	PAN HEAD SCREW M1.4+
40	863125	NUT M2.5
41	24605670	SPRING
42	24611330	TAPE GUIDE
43	863120	NUT M2
44	24606289	SENSOR
48	24605671	SPRING
49	24602438	PINCH ROLLER AS (R)
55	24606284	P.C.B.
59	24606285	LEAF SWITCH
60	24601230	REEL MOTOR AS
62	24603350	ASSIST LEVER (A)
63	24605673	SPRING
65	24602443	BRAKE PULLEY
66	24610952	WASHER 2.6+5.5+0.13
67	24611331	BRAKE RUBBER
68	24602444	BRAKE PULLEY
69	24603351	ASSIST LEVER (B)
70	24611333	SUB CHASSIS
71	24606286	YOKE AS
72	24606287	CORE
73	24605674	SPRING
74	24609011	SPECIAL SCREW M2.6+1.6
75	24605675	SPRING
76	24602445	REEL
77	24611334	REFLECTOR (5P)
78	24605676	SPRING
79	24611335	HOLDER (CASSETTE)
80	24606288	SENSOR
85	24603352	EJECT LEVER
90	82112630	PAN HEAD SCREW M2.6+
92	24603353	LEVER (R)
93	24603354	EJECT LEVER (R)

TAPE-2

REF.NO.	PART NO.	DESCRIPTION
1	24610673	WASHER
2	24611295	WASHER 2.2+7+0.8
3	24611325	MECHANISM CHASSIS
4	24602432	ASSIST GEAR
5	24602433	CAM
6	24606282	CONTACT
7	24611337	WASHER 7+8+.5
8	82112003	PAN-HEAD SCREW M2+3
9	24606283	CONTROL P.C.B.
10	24611294	WASHER 2.3+4.7+0.5
11	24602446	FLYWHEEL AS
12	82112003	PAN-HEAD SCREW M2+3
13	24611148	WASHER 2.6+4.7+0.5
14	24602435	FLYWHEEL
15	24602436	BELT
16	24611326	THRUST SPRING
17	82112603	PAN-HEAD SCREW 2.6P+3
18	24611327	BRACKET (MOTOR)
19	24601231	CAPSTAN MOTOR AS
21	833126082	TAPPING SCREW M2.6+8
22	24603349	LEVER (SLIDE)
23	24611336	REFLECTOR
25	24602437	PINCH ROLLER AS (L)
29	24609010	SPECIAL SCREW M2+3
30	24602440	GEAR
31	24605668	SPRING
32	24602441	GEAR (HEAD)
33	24604089	SHAFT (HEAD BASE)
34	24611328	HEAD BASE AS
35	24605669	SPRING
36	24609009	ADJUSTING SCREW
37	24611329	BRACKET AS (HEAD)
38	24600074	HEAD
39	82111406	PAN HEAD SCREW M1.4+6
40	863125	NUT M2.5
41	24605670	SPRING
42	24611330	TAPE GUIDE
43	863120	NUT M2
44	24606289	SENSOR
48	24605671	SPRING
49	24602438	PINCH ROLLER AS (R)
55	24606284	P.C.B.
59	24606285	LEAF SWITCH
60	24601230	REEL MOTOR AS
62	24603350	ASSIST LEVER (A)
63	24605673	SPRING
65	24602443	BRAKE PULLEY
66	24610952	WASHER 2.6+5.5+0.13
67	24611331	BRAKE RUBBER
68	24602444	BRAKE PULLEY
69	24603351	ASSIST LEVER (B)
70	24611333	SUB CHASSIS
71	24606286	YOKE AS
72	24606287	CORE
73	24605674	SPRING
74	24609011	SPECIAL SCREW M2.6+1.6
75	24605675	SPRING
76	24602445	REEL
77	24611334	REFLECTOR (5P)
78	24605676	SPRING
79	24611335	HOLDER (CASSETTE)
80	24606288	SENSOR
83	24603355	LEVER
84	24603356	EJECT LEVER (L)
85	24603352	EJECT LEVER
90	82112630	PAN HEAD SCREW M2.6+30

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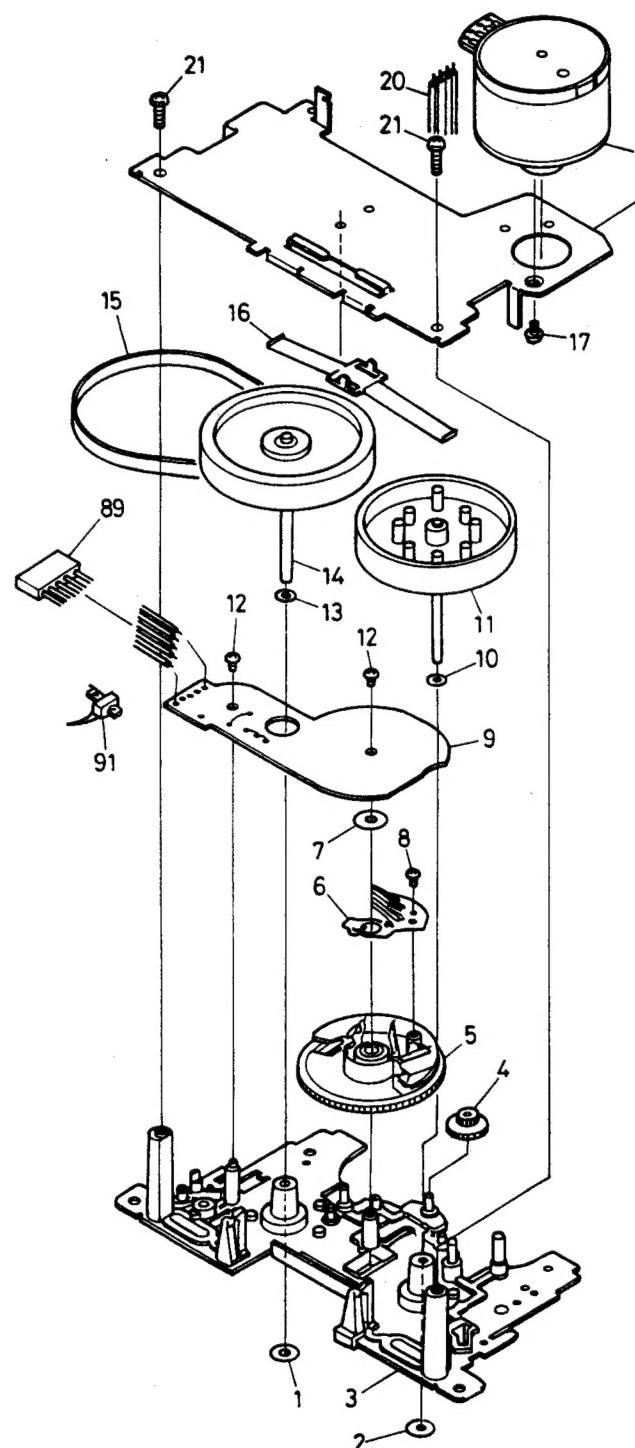
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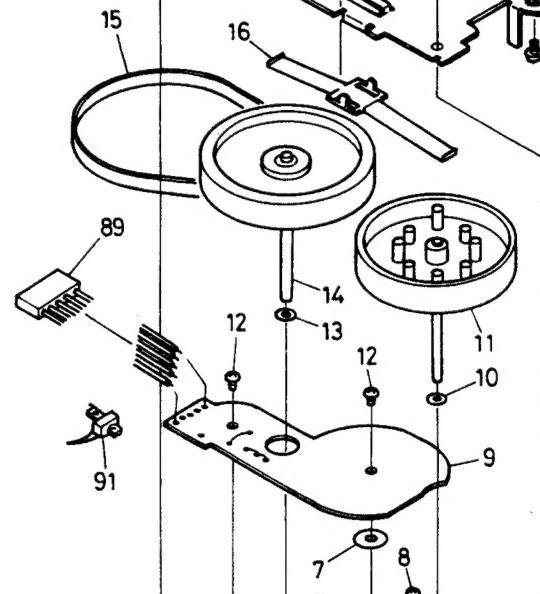
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## TAPE MECHANISM-EXPLODED VIEW (TAPE-1)

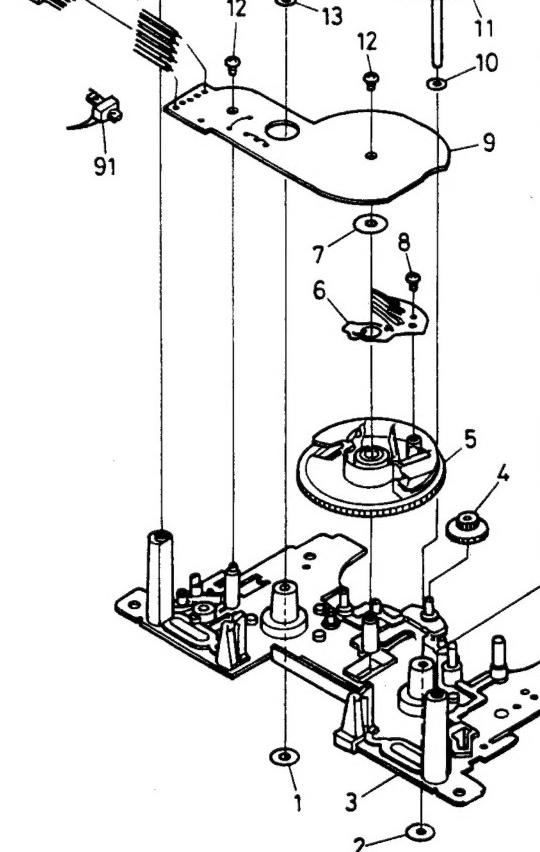
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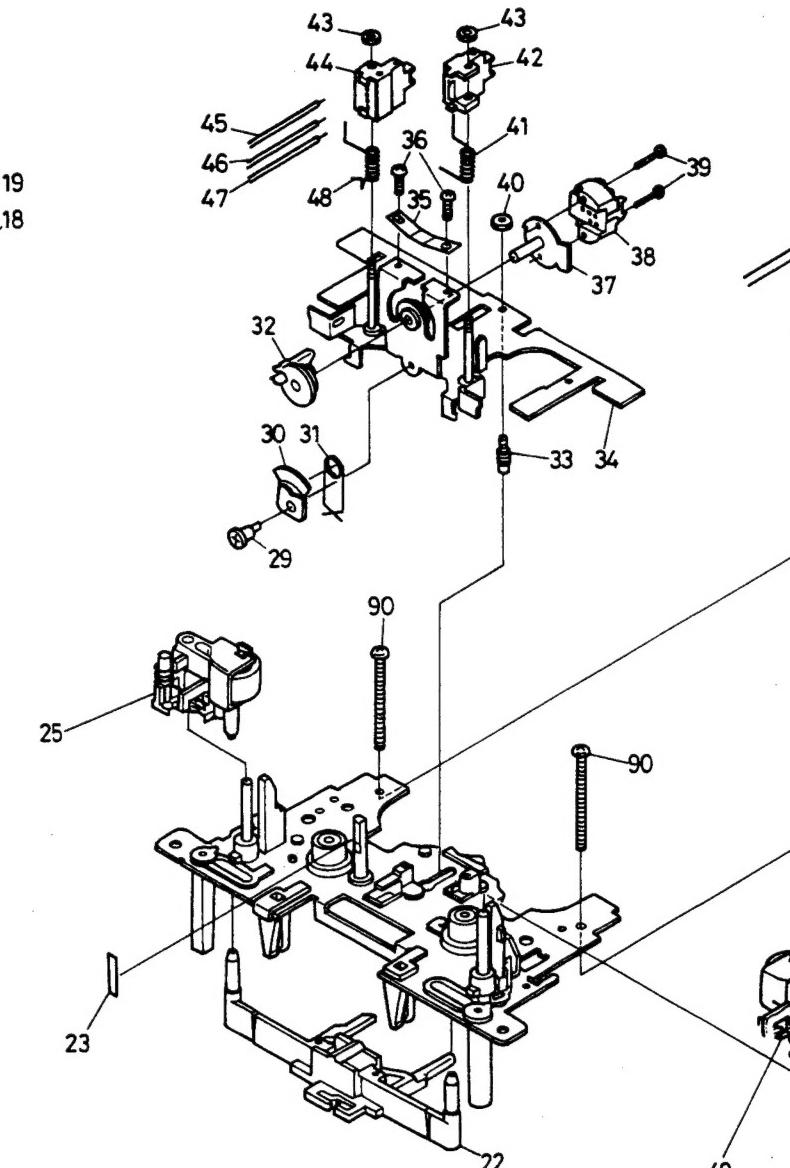
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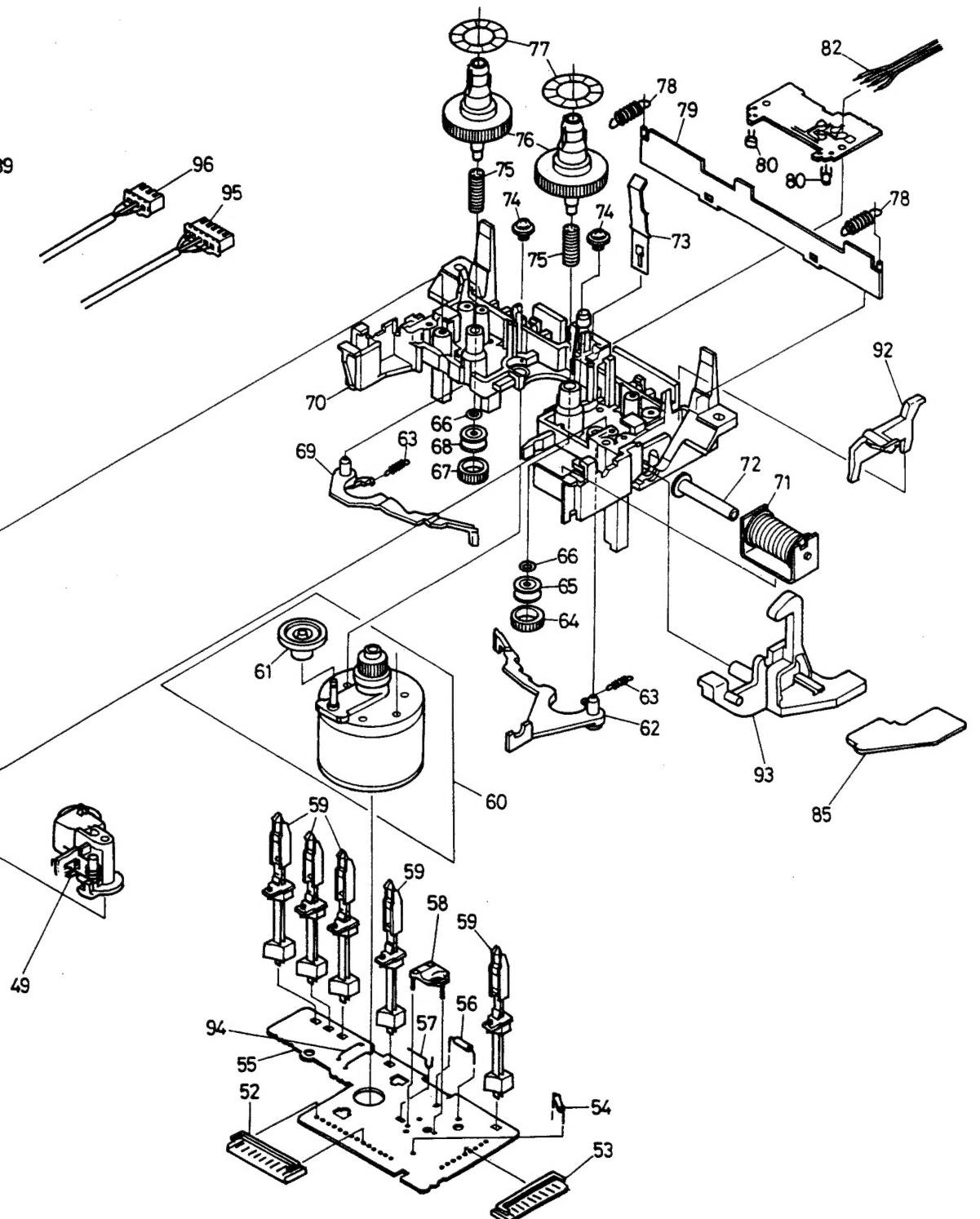
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D



- 35 -



- 36 -

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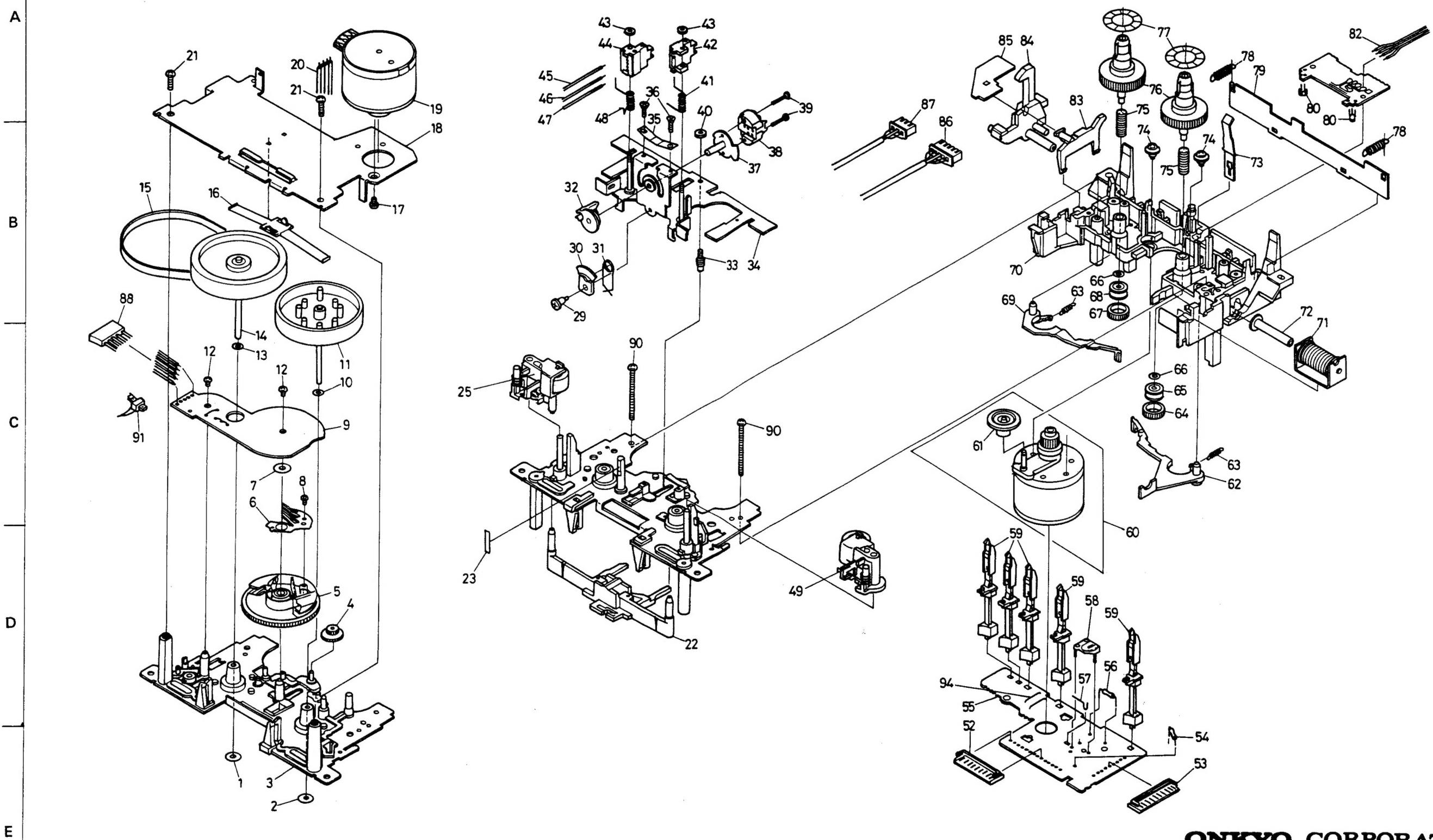
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## TAPE MECHANISM-EXPLODED VIEW (TAPE-2)

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